POPULAR
Computing
WEEKLY

35p 10-16 March 1983 Vol 2 No 10

This Week

News Desk



Peanut micro to challenge Apple

THE PEANUT costs just over £300 and is being imported from the Far East by Peanut Computers for sale in the UK in April.

In a nutshell, said the company's Chris Roberts, the machine offers the facilities of an Apple for a fraction of the cost.

The 6502 based 48K colour computer will run software written for the Apple II and will accept the range of applications cards — such as the Z80 card for CP/M — produced for the American machine. The Peanut also has a cassette interface (1,500 baud), monitor and tv outputs and a full size integral keyboard.

Display format in low resolution mode is 40 × 48 characters each 7 × 5 pixels. The high resolution mode has a black and white resolution

Continued on page 5

CTA holds inaugural meeting

THE Computer Trade Association (CTA) — formerly the Society of Computer Manufacturers, Agents and Dealers — held its first meeting last Saturday.

The aims of the association are to develop a recognised code of practice and trading standards for the industry as a protection for the buying public. The group also hopes to resolve problems in the trade, to tackle issues of copyright protection, illegal copying, trademark and licence infringements and unauthorised hiring and lending of software.

At this first meeting, Tony Shiel of Knot Komputing was elected Chairman and Nigel Backhurst was elected Secretary.

A working party was set up to produce a draft constitution and begin working on a framework of ethical guidelines that will become the CTA's code of practice. A separate committee was set up

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POPULAR Computing WEEKLY



10-16 March 1983 Vol 2 No 10



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Hobhouse Court 19 Whitcomb Street
London WC2 7HF
Telephone **01-839 6835**
Published by Sunshine Publications Ltd
Typesetting origination and printing by
Chesham Press Chesham Bucks
Distributed by S M Distribution
London SW9 01 274 8611 Telex 261643

Subscriptions
You can have *Popular Computing Weekly* sent to your home
UK Addresses
26 issues £9 98
52 issues £18 95
Overseas Addresses
26 issues £18 70
52 issues £37 40

How to submit articles
Articles which are submitted for publication should not be more than 3 000 words long The articles and any accompanying programs should be original It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted

All submissions should be typed and a double space should be left between each line Please leave wide margins

Programs should whenever possible be computer printed

We cannot guarantee to return every submitted article or program so please keep a copy If you want to have your program returned you must include a stamped addressed envelope

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

This Week

Editorial

British software writers have long been highly regarded by the rest of the world Many of our top business and applications programmers are now working abroad, tempted by salaries and conditions that UK firms cannot match

Now it would appear that British games programmers are about to tread the same path as their more business orientated predecessors Parker Brothers placed an advertisement in this week's *Sunday Times* for "Hardware and software engineers — the challenge in electronics is the games people play" The US-based firm is offering up to £30 000 a year for graduate programmers with three years experience of Z80, 8085 and 6502 assembly languages who are willing to move to Boston

With the Timex Sinclair 2000 due to be launched in the US in June there is clearly a demand for innovative programmers British software for the ZX81/TS1000 is already selling well in the US — and most of the major UK firms have already tied up distribution deals for their Spectrum software

While the incentives for budding games programmers to move abroad are clearly great I cannot help hoping they will be resisted Rather than exporting our top programmers, I would prefer to see us exporting our top programs

Next Thursday

Do you have what it takes to rule a country? Could you defend a state against its enemies without starving your own population to death? Find out next week in King Cedrick, a new game for the unexpanded Vic20

TELEWRITER™
the DRAGON 32 Word Processor

TELEWRITER

Telewriter is the powerful word processor designed specifically for the DRAGON 32 Computer. It can handle almost any serious writing job and is extremely easy to use. It has all the advanced features you need to create, edit, store, format and print any kind of text. With Telewriter you can quickly produce perfect, finished copy for letters, reports, term papers, articles, technical documentation, stories, novels, screenplays, newsletters. It is also a flexible and efficient way to take notes or organize ideas and plans.

51 × 24 DISPLAY

The DRAGON 32 is an incredibly powerful and versatile computer, but for text editing it has some major drawbacks. The small 32 character by 16 line screen format shows you too little of the text and, combined with its lack of lower case letters, bears little resemblance to the way text really looks on the page. Reverse video in place of lower case just adds confusion.

Telewriter eliminates these shortcomings with **no hardware modifications required.** By using software alone, Telewriter creates a new character set that has **real lower case letters,** and puts 24 lines of 51 characters on the screen. That's more on screen characters than Apple II, Atari or TRS-80 Model III. That's more than double the DRAGON 32's standard display.

FULL SCREEN EDITOR

The Telewriter editor is designed for maximum ease of use. The commands are single key (or single key plus control key), fast, and easy to remember. There is no need to switch between insert modes and delete modes and cursor movement modes. You simply type. What you type is inserted into the text at the cursor on the screen. What you see on the screen is always the current state of your text. You can move quickly through the text with one key cursor movement in all 4 directions, or press the shift key simultaneously for fast auto-repeat. You can jump to the top or bottom of the text, and beginning or end of a line, move forward or backward a page at a time or scroll quickly up or down. When you type past the end of the line, the wordwrap feature moves you cleanly to the next.

You can copy, move or delete any size block of text, search repeatedly for any pattern of characters, then instantly delete it or replace it with another. Telewriter gives you a tab key, tells you how much space you have left in memory, and warns you when the buffer is full.

The only one with all these features for your DRAGON 32

51 column × 24 line screen display
Sophisticated full screen editor
Real lower case characters
Powerful text formatter
Works with any printer
Special MX 80 driver
Requires absolutely no hardware modifications
★ Tandy colour version also available

FORMAT FEATURES

When it comes time to print out the finished manuscript, Telewriter lets you specify left, right, top, and bottom margins, line spacing and lines per page. These parameters can be set before printing or they can be dynamically modified during printing with simple format codes in text.

Telewriter will automatically number A4 pages (if you want) and centre lines. It can chain print any number of text files from cassette without user intervention. You can tell it to start a new page anywhere in the text or pause at the bottom of the page.

You can print all or any part of the text buffer, abort the printing at any point, and there is a "Typewriter" feature which allows you to type straight to your printer. Because Telewriter lets you output numeric control codes directly (either from the menu or during printing), it works with any printer (Tandy, Seikosha, MX 80, Okidata, NEC 8023, C. Itoh 8510, Centronics, GP, Terminet, Smith Corona TP 1, etc.).

There's even a special driver for the Epson MX 80 that lets you simply select any of its 12 fonts and do underlining with a single underline character.

CASSETTE INPUT/OUTPUT

Because the Telewriter makes using cassette almost painless, you can still have a powerful word processor without the major additional cost of a disk. The advanced cassette handler will search in the forward direction till it finds the first valid file, so there's no need to keep retyping a load command when you are lost in your tape. The Verify command checks your cassette save to make sure they're good. You can save all or any part of the text buffer to cassette and you can append pre-existing files from those you have in the buffer already.

ASCII COMPATIBLE

Telewriter turns your DRAGON 32 into the most powerful, lowest cost word processor in the world today. But that's not all. The simple ASCII conversion program provided with Telewriter means you can use the full power of the Telewriter editor for creating and editing BASIC and assembly language programs. It means you can use Telewriter to prepare or edit text files used with any data communications program.

Telewriter costs £49.95 on cassette and is

AVAILABLE FROM DRAGON 32 DEALERS NATIONWIDE

OR DIRECT FROM

MICRODEAL

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SEND FOR OUR FREE SOFTWARE LISTS FOR DRAGON 32 & TANDY RANGE OF COMPUTERS. PLEASE STATE WNICN COMPUTER YOU OWN

Name ____________

Address ____________

Make / type of computer ____________

Please include a 1st Class Stamp

DRAGON 32 is a trademark of Dragon Data Ltd



No Spectrum upgrades

SINCLAIR Research has not yet begun to offer Ram upgrades to convert 16K Spectrums to 48K machines

Ever since the Spectrum was first advertised in June last year the company has promised the upgrade "The problem is not how to do the modification" said a Sinclair spokesman "but how one makes the upgrade available

"We plan to make the service available in sections of 16K purchase fairly and in sequence" he said.

Apparently the upgrades will begin "in a matter of a very few weeks" at a cost of £60 which includes parts labour and all postal charges

Monopoly no more

PARKER Brothers has lost its battle to keep its US trademark in the Monopoly board game (see *Popular Computing Weekly*, February 24)

The US Supreme Court last month upheld an earlier California appeal court decision that the word 'Monopoly' had become a "commonly descriptive name for real estate board games" The court ruled that Parker Brothers was therefore no longer entitled to the trademark it has held since 1935

Peenut power

Continued from page 1

of 280 × 192 pixels — colour resolution in this mode is 140 × 192 pixels Both upper and lower case characters are provided

The basic Peanut costs £299 plus VAT Other prices (exclusive of VAT) are disc drive card £27 95 Z80 card £46 50 Centronics interface £33 75 and RS232C £38 25 Language cards and an 80-column card also cost around £40 A disc drive is also available — cost under £200

"The Peanut is priced very realistically" commented Mr Roberts "If it seems so then one should ask why the Apple is so expensive"

The Peanut Computer will be available from the middle of April by mail order only from Peanut Computers Dewsbury West Yorkshire

CTA chairman Tony Shell (facing left) and secretary Nigel Backhurst (facing right)

Continued from page 1

to investigate questions of copyright and software lending

The CTA is to develop a standard warning against unauthorised use of software A watchdog will monitor the activities of lending libraries It was suggested that the CTA might follow this with an action to fight a test case

Membership of the CTA now includes Atari Tandy Computers Bug Byte Silversoft Carnell Virgin Games, Oxford Computer Publishing Lothlorien, Microware and Buffer Micro Shop

The next meeting to be held in London on Tuesday March 29 at 11 am (venue yet to be decided) will consider the draft constitution and the code of practice Details from Nigel Backhurst (Tel 0530 33566)

Build your own micro

A 6809E based computer board is being manufactured by Adaptors (Engineering) All that is needed to turn it into a powerful computer is a keyboard and a tv

The board includes 64K Ram Its 16K on board firmware provides Basic 6809 assembly language and D9E Hex editor Keyboard input is standard Ascii — output to a black-and-white television or RGB colour monitor is possible A colour encoder board which decodes the colour and upper and lower case for use with an ordinary colour tv is available as an option

Interfaces include a 1 600 baud cassette port and five 50-way buffer ports These latter can be used to connect discs parallel or serial I O ports up to 2M of additional memory or a sound board

The central C9E board will sell for £185 The keyboard is priced at £40 the mains adaptor is £18 70 and the colour encoder board (available late April) is £56 The disc interface and operating system — Flex 9 or a free format system (enabling individual disc operating systems to be supported) which can handle up to eight double sided double density drives — is £120 Serial and parallel interfaces are scheduled for May

Memory expansion options include a 64K unit with Z80 second processor to run CP/M for £97 or a 128K board for £160 which can be simply expanded (only the chips are required) to 2M

More details from Adaptor (Engineering) 94 Tower Hamlets Road Forest Gate London E7

Apple fights to ban cheap imitations

APPLE is continuing its campaign to stop the import and sale in the US of what it claims are low cost Apple II look alikes — so-called rotten apples

The company has persuaded the US International Trade Commission to look into alleged infringements of Apple s patents and copyrights in machines produced in the Far East — Hong Kong Taiwan and Singapore

This move follows Apple s earlier unsuccessful attempt to take legal action in Taiwan against two companies — Sunrise Computer Services and Golden Formosa The actions were dismissed by the Taipei court on a technicality Apple claimed infringement of copyright in the Apple II Rom

Apple II "look-alikes" on sale in the US and Europe can be bought for less than half the cost of the original machine

Price unchanged

TEXAS Instruments' £50 discount voucher scheme for the TI 99/4A home computer has been so successful that the offer is to be continued indefinitely

"The major reason the 99/4A machine was not selling was price," said Michael Lunch TI (UK)'s managing director

The TI99/4A now sells for between £149 95 and £159.95

Machine code instructione

I noticed in this week's *Popular Computing Weekly* (January 20-26) in the *Peek & Poke* column a question about three Z80 machine code instructions *in f (c)*, *ld (nn) hl* and *ld hl (nn)*.

The seven *in* instructions that input into a register using the c register as the port address are well documented in the Z80 assembly language manual. They have the side effect of setting the flags to show the status of the data byte read in — whether it is zero, positive, etc.

The *in f (c)* instruction is not well documented in the assembly manual (and I believe it is not available in Zilog's own assembler) but the corresponding machine code is in the Z80 hardware manual so I felt justified in listing it as a standard Z80 instruction: it is part of the specification of the Z80 chip. Its effect is to set the flags in the same way as for the other seven instructions but then to throw away the data byte itself without storing it anywhere.

The *ld (nn) hl* and *ld hl (nn)* instructions derive from the way the Z80 was designed to be upward compatible with the Intel 8080. Both instructions are available unprefixed on the 8080 and so they had to be available on the Z80 as well. However the Z80 also includes the non-8080 instructions *ld (nn) bc*, *ld bc (nn)*, *ld (nn) de* and so on, all prefixed. It seems that it was easier to include a second redundant version of *ld hl (nn)* and *ld (nn) hl* in this set.

Steve Vickers
22 Foxholhw
Bar Hill
Cambridge

For those of you who don't know, Steve Vickers wrote the Spectrum manual. He also developed the Jupiter Ace, in conjunction with Richard Altwasser.

A bug by any other name

Every Spectrum does what David Edwards describes as a bug (*PCW* December 9 1982). It is not really a bug though.

When a six is pressed in E mode two control characters are inserted into the line. These are 17 and 6 (ie Paper 6). When *Delete* is pressed the Rom removes the 17 code first. When the line is reprinted the cursor jumps to the middle because the only character code in the line is now 6 which is the comma control code.

Andrew Pennell
14 Swean Road
Cliftonville
Kent

The missing link

In my piece on machine-coding the Spectrum — page 22 of your February 3-9 issue — a number has gone missing in the data for the first machine-code routine. Line 50 should read

```
50 DATA 205 36 126 135 135 135
50 143 82 8,32 12 32,215 16 251
205 36 (etc as printed)
```

ie with an extra 32 after 62 in the second line. Also, less seriously, the mysterious instruction

```
LD 32600
```

in the disassembled listing of the second routine should read

```
LD DE, 32600
```

Geoff Wickins
34 Farnham Road
Handsworth
Birmingham B21 8EG

Recording probleme solved

I'm writing to you to advise you on recording problems with your Dragon 32. I am not a computer expert, but I feel I can resolve your problems. The following information has been derived from Dragon Data audio experts and by trial and error. Now I have no problems and find the Dragon a beautiful machine to use. So please try the following tips.

1) Do not listen to people that say, get a cheap recorder — You will almost certainly need a good mono recorder with automatic level control in order that your data is not corrupted.
2) Volume control is important, so make a note of best setting.
3) Ensure recording heads are clean.
4) Important: On a new tape insert a pencil into cassette and wind leader tape on until it is just past the recording head. If you rewind the tape fully before saving, you will try to record the program "Title" on the leader tape. Hence on loading, the Dragon is unable to find the program as it looks for the program "Title" but does not find it.
5) When recording a second program rewind the tape fully and type in *Skipf "Title of program"*, switch on recorder and press enter. The tape will wind on and stop just past the first program — start recording the second program at this point. Do not leave too large a space between programs, as the Dragon hears the hiss of the blank tape and the recorder motor rumble, and responds with an *I/O* error.
6) If the above points fail, try removing the jackplug to ear socket when recording and removing the jackplug to mic socket when playing back, as sometimes a feedback loop is formed and corrupts the data.

B Jones
19 Cefn Park
Skewen
Neath
West Glamorgan

Compiling the errors

A few errors crept into my *Compiler* program printed in the 24 February-3 March issue of your magazine. I have listed the corrections below.

```
LINE 27    PRINT O
LINE 50      PRINT( OF   AND
             R$(PI)= O ) O is a
             letter
LINE 60     R$(SGN PI)  I  I is a
            letter
LINE 60    AND R$(VAL 2 )   C )
```

Also I would be grateful if you would publish the fact that my first name is *Richard* not *Robin* as printed.

Richard Wright
234 Kew Road
Richmond TW9 3UX

Undeserving astrologers

In this scientific and so-called enlightened age I find the supply of astrology software as the ultimate insult to human intelligence. It makes me consider whether or not we deserve the technology we use.

Perhaps it is fortunate that computers cannot as yet think!

T P Byatt
51 Wakehurst Place
Rustington
West Sussex

Software libraries defended

On the subject of software libraries, we believe that your readers will find the following of interest to them.

Part of our business at Cotswold Computers is the running of such a library dedicated to the Dragon microcomputer. It is our policy to approach software suppliers suggesting that a financial agreement be reached to enable us to hire out their programs. So far we have reached agreement with 70 percent of the software suppliers who have responded to our initial contact. The minority of suppliers who do not agree to the hire of their software are however keen for the sale of their software to proceed.

Therefore, at present our library has a possible content of approximately 70 different software titles. We are also able to offer for sale at special prices 90 plus pieces of software for the Dragon. Members thus have the opportunity of sampling a majority of software before contemplating purchase.

As previously intimated the position is changing weekly as additional suppliers make contact and as new software is released.

I hope the above facts help to allay the fears of any Dragon owners concerned that they might join a library only to find it fold through lack of software — but please inquire as to whether agreements have been made with software suppliers.

David and Susan Thomlinson
Cotswold Computers
Park Hill
Hook Norton
Oxon

Womp-Rat

A new game for ZX Spectrum by Derek Spring

IN Womp-Rat you are the son of a lowly moisture farmer. Your mission is to defend the farm from the hordes of thirsty Womp-Rats which are attacking it.

The Womp Rats start from the top of the screen and move down towards your farm at the bottom. You are in the middle and can move left or right firing your twin lasers up at the Womp Rats until they pass you. Then you can turn 180 degrees to fire down at the remainder. You can only turn once each row of Womp-Rats and the number of rats increases with each successive wave.

The program was written to make use of *Def Fn* as a *Left* or *Right String*. Lines 10-190 set up the screen, the graphic characters and the string which contains the Womp-Rats. Lines 210-230 control the movement of the rats.

Lines 250-320 control your movement, and check to see if you are firing or turning. Lines 340-390 are your firing routine, while 400-430 check to see if you are out of the limits of the screen. Lines 440-510 are the instructions, while 9000-9030 are data for the graphics characters.

The figures in lines 20-30 correspond to graphics character keys, all being used with *Caps Shift* except 7s and 3s. Lines 170, 190, 280, 360, 365, 370 contain the defined graphics characters.

The speed of the game can be changed in line 310 by altering the maximum value of *G*, but 5 seems best.





```
  1 GO SUB 440
 10 BORDER 0  PAPER 0  INK 2  C
LS
 20 PRINT AT 20,0,"[redacted]"
 30 PRINT AT 21,0,"[redacted]"
 40 PRINT AT 0,0  INK 7, PAPER
0,"              SCORE 0
"
 50 FOR N=144 TO 147
 60 FOR M=0 TO 7
 70 READ A  POKE USR CHR$ (N)+M
,A
 80 NEXT M
 90 NEXT N
100 RESTORE
110 FOR M=0 TO 7
120 READ A
130 POKE USR CHR$ (148)+(7-M),A
140 NEXT M
150 DEF FN A$(C$,D)=C$( TO D-1)
160 DEF FN B$(C$,D)=C$(D+1 TO )
170 LET S=0  LET L=-1  LET Y=15
  LET E$="A"  PRINT AT 10,Y, INK
1,E$
180 LET G=1  LET E=1  LET B=1
LET C$=""
190 FOR C=1 TO E  LET D=INT (RN
D*29)+2  LET C$=FN A$(C$,D)+"C"+
FN B$(C$,D)  NEXT C
210 IF B=19 THEN PRINT AT 2,0,"
 THE WOMP-RATS HAVE REACHED
 YOUR MOISTURE FARM AND YOU
  HAVE LOST YOUR HARVEST"  FO
R Q=0 TO 60  BEEP .01,Q  NEXT Q
 FOR Q=1 TO 100  NEXT Q  RUN
215 PRINT AT B,1,"
"
220 LET B=B+1  IF B=10 THEN LET
B=11
230 PRINT AT B,1  INK 0,C$
240 LET G=1
250 LET D$=INKEY$
260 IF D$="n" THEN LET Y=Y-1  G
O SUB 400  PRINT AT 10,Y+1," "
PRINT AT 10,Y, INK 1,E$
270 IF D$="m" THEN LET Y=Y+1  G
O SUB 420  PRINT AT 10,Y-1," "
PRINT AT 10,Y, INK 1,E$
280 IF D$="z" THEN LET E$="E"
PRINT AT 10,Y, INK 1,E$  LET L=1
300 IF D$="x" THEN GO TO 340
310 IF G=5 THEN GO TO 210
320 LET G=G+1  GO TO 250
340 LET M=10  LET N=Y
350 FOR P=1 TO 9  LET M=M+L
360 IF CODE SCREEN$ (M,N)=0 THE
N PRINT AT M,N, INK 0,"D"  BEEP
.02,20  LET S=S+1  PRINT AT 0,18
, PAPER 0, INK 7,S  LET M=10  FO
R P=1 TO 9  LET M=M+L  PRINT AT
M,N," "  NEXT P  LET D=N  LET C$
=FN A$(C$,D)+" "+FN B$(C$,D)  IF
 C$<>"
     " THEN GO TO 210
365 IF C$="
     " THEN LET E=E+1  LET
B=1  LET E$="A"  PRINT AT 10,Y,
INK 1,E$  LET L=-1  GO TO 190
370 PRINT AT M,N,"B"
380 NEXT P
385 LET M=10  FOR P=1 TO 9  LET
M=M+L  PRINT AT M,N," "  NEXT P
390 GO TO 210
400 IF Y<0 THEN LET Y=0
410 RETURN
420 IF Y>31 THEN LET Y=31
430 RETURN
440 BORDER 1  PAPER 1  INK 7  C
LS  PRINT  PRINT "YOU ARE A MO
ISTURE FARMER'S SON.A HORDE OF T
HIRSTY WOMP-RATS IS ATTACKING YO
UR MOISTURE FARM ANDTHREATENS YO
UR HARVEST. YOUR   MISSION IS T
O PINPOINT THE WOMP-RATS IN YOUR
 T-16 BEFORE THEY   REACH THE FA
RM."
450 PRINT AT 10,11,"CONTROLS"
460 PRINT AT 12,8,"N - MOVE LEF
T"
470 PRINT AT 14,8,"M - MOVE RIG
HT"
480 PRINT AT 16,8,"X - FIRE"
490 PRINT AT 18,8,"Z - TURN 180
'"
500 PRINT AT 21,8, FLASH 1,"PRE
SS ANY KEY"  PAUSE 0
510 RETURN
9000 DATA 24,24,189,189,255,255,
189,24
9010 DATA 129,129,129,129,129,12
9,129,129
9020 DATA 14,25,60,126,126,60,60
,24
9030 DATA 4,9,36,58,102,12,32,24
```

Tomorrow's heroes

***David Kelly** talks to Nick Alexander, head of the newly-formed Virgin Games*

Computers are the latest arena into which media magnate Richard Branson is nudging his Virgin Group of companies. Branson's decision to go for video games will add another facet to an empire that has a turnover of £50m and spans the record, film, book and video industries.

This new tendril, called Virgin Games (see *Popular Computing Weekly* February 24), is located in miniscule offices in London's Portobello Road. Nick Alexander, boss of the new company, has only been in the job for five weeks, but already he has a clear idea of what he hopes to achieve. "We will work on similar lines to a record company. Instead of having in-house programmers, we will build up a roster of successful freelancers, using Virgin's substantial resources to promote them."

The record industry is something Nick is familiar with. After leaving college, he worked for EMI records marketing such bands as *Angelic Upstarts* and *Dexys Midnight Runners*.

After becoming Marketing Manager for HMV Record Stores, he got his first taste of computers when he was appointed to mastermind Thorn EMI's push into the video games market.

"All credit to a chap at Thorn/EMI called Byron Turner. He saw the potential in video games five years ago and he steadily built up a number of titles. When I joined all the titles were already there. What I was so pleased about, particularly as I had to market them, was that the software was original — we didn't have *Space Invaders* and *Pac Man* rip offs.

"What I did was to take all the programs available and put them out. Rather than just releasing five or six, we wanted to make a big impact. We didn't expect all the titles to sell well — we recognised that there were some weaker programs. The problem really for Thorn was that all the material had been produced in a vacuum — they had never been in video games before."

Virgin birth

Towards the end of last year the managing director of Virgin's record chain left to go to a video company. And largely because of Nick's earlier success in giving the HMV record stores a facelift, Richard Branson approached him to see if he would be interested in the job. "I said that I felt the video games market was more interesting. Richard said it was something he had been looking at too, so the idea of Virgin Games was born — it was really a series of coincidences.

"At the moment what we are looking for is existing programs to put out. Already I have been sent some material that is quite remarkable — there are people writing some very different kinds of games."

Nick is keen that Virgin Games should not get involved in doing versions of established arcade games for home computers — he feels this is a destructive approach. Virgin will operate as a marketing and distribution centre. The emphasis will be on individuals.

"I'm looking for a pool of freelance machine-code programmers who have some material so we can start to build their name. With some of the smaller companies we will credit their organisation, but it is much harder to market a software house than an individual in a way to catch the imagination of the public.

"I am sure that it is an almost inevitable part of the way the market will build up that there will be video stars.

"I strongly believe that *Another Title* from Virgin Games is less interesting than *Another Title* from Joe Bloggs.

"We should have the first game out at the beginning of June — this gives us plenty of time to get our distribution sorted out before Christmas. I would like to see us put out 30 titles this year. It is unlikely that we will offer the same game on more than one machine in the beginning — I would dearly love to pick up titles that we could launch simultaneously on more than one machine but, for a program in machine-code, that is not so easy. Besides, different sorts of people buy different computers. The sort of game that would be a sure-fire success on the Atari need not necessarily do well on the BBC."

The new company is interested in software for any machine currently available. If the Oric can be produced in quantity, then Virgin will do material for that too.

"The Oric could be like the Dragon. I was amazed how the Dragon 32 sold with virtually no software back up. I think that situation is changing though — as the market broadens, attention will switch from the hardware to the software."

The software market is still growing at a phenomenal rate. Nick points to market research which shows that 90 percent of those who buy a computer do so to learn to program. Six months later only 10 percent have done so. The rest are playing games.

"To begin with, Virgin software will be cassette based. We will keep an open mind — I have no hard and fast feeling for the carrier for our software. I don't see any rush to get into Rom for example — and I think people are happy to pay a bit less for their games. The only advantage was for piracy reasons, cartridges being more difficult to copy, but I have recently discovered that it is comparatively easy to pirate Roms. In the US there are now ways of easily down loading Roms into a sort of Eprom. As far as I'm concerned, cartridge software now looks less attractive.

"Presentation is one of Virgin's strengths and our packaging will be innovative. We also have to try to discourage people from borrowing a friend's copy of one of our cassettes. Home taping is an enormous danger. We have seen the video tape business almost destroyed over the last two years."

No incentive

Even now 75 to 80 percent of the video market is illegal material. If that was to happen to the software market, Nick reckons the supply of new games would just dry up — there would be no incentive.

Nick sees the new Virgin Games subsidiary as being ideally placed in the market. "We have the resources to put behind a product to market it for all its worth and to put it out to as wide an audience as possible. I see our immediate competition as companies like Quicksilva and Bug Byte rather than Atari and Thorn. And with the resources within Virgin, we can sell more copies of a given program than they would be able to."

As for Virgin, the parent company is obviously taking the venture seriously. "Richard is aware that the record industry is not going to continue to grow at the rate it has done. He is mindful that video games could be one future for Virgin.

"The cult heroes of tomorrow could be the computer programmers, not the musicians. Rather than programmers putting on sequinned suits, maybe we will have to redefine what a super star looks like!" ■

A word or two in your ear

***Keith end Steven Brain** take a close look at Telewriter – a Dragon word-processor*

One of the advantages of the "look-alike" design of the Dragon is that numerous programs have already been beveloped in the US for the Tandy Colour Computer although certain differences in the Rom mean that some programs are not directly interchangeable Without doubt one of the most impressive programs produced for the Tandy Colour Computer is a word processing package known as *Telewriter* A new version of this program specially modified for the Dragon has now been launched in the UK by Microdeal At £50 it must be the most expensive Dragon program on offer, so what exactly does it do and can any software be worth a quarter of the cost of the computer it runs on?

The basic function of a word processor is to create and store text in a computer in such a form that it can easily be edited formated and printed Word processing is rapidly becoming the norm in the business world but trying to explain the value of word-processing to those who have never used it is like the old Bob Newhart record where he plays Sir Walter Raleigh trying to explain tobacco to the court of Queen Elizabeth the First! While word processing is every bit as habit-forming as smoking the side effects are probably restricted to eyestrain and perhaps an inability to write without a keyboard and vdu

In essence a word processor replaces "rough drafts" "notes on scrap paper (or backs of envelopes) and repeated rewriting of commonly used text It enables you to type out your first thoughts and then easily modify them as your ideas change before finally arranging them on the page in the most suitable way and printing them out A standard office package like *Word star* costs around £250 and runs on a £2 000 machine

Habit forming

Telewriter comes on cassette and consists of a machine code file which is loaded by *Cloadm* in less than a minute and started by *Exec* The cassette contains four versions of the program but these only differ in that they are configured for different printers It also contains a bemonstration text program and the *Convert* program The programs are repeated on the reverse side In addition the package includes comprehensive documentation comprising the *Telewriter Tutorial Reference Manual* and *Moving Basic Programs in and out of Telewriter*

The tutorial starts from scratch and assumes no previous knowledge of programming or word-processing It provides a step-by-step introduction to the various features of *Telewriter* in a very well presented accurate and understandable form The reference manual covers much of the same ground but in a more ordered format and has a comprehensive index and a useful command summary table Although the program was originally written as a word processor It can also be used as an extended editor for Basic programs with the aid of *Convert*

The only little complaint about the documentation is that the alterations for the Dragon version were obviously done with good old-fashioned Tippex rather than *Telewriter* (apparently because the only copy of the text was on the non compatible Tandy disc version and in the US)

When *Telewriter* is executed a copy right notice appears Pressing *Enter* leads to the main menu where the available commands appear in inverse video These are *Create Edit Save % Save Read In Append Verify Format* and *Words* The main menu also gives the name of the last file read in and the amount of space remaining for text At start-up space is a very reasonable 18 500 characters (about 9 A4 pages) which compares well with about 7 000 in *Wordcraft* on the Vic20

Pressing the appropriate key (first letter of word) carries out your command *Create* and *Read In* are the only commands which destroy the material already in the text buffer and they are carefully mug-trapped requiring upper case confirmation of your intentions before being acted on *Edit* leads you to the text currently in the buffer returning you to your last position in the file

The *Save* command requests a filename and then transfers the whole text file to cassette As files are saved as machine code transfer is much faster than with other low cost systems which use Ascii dumps The useful *% Save* feature (called as %) allows you to save individual parts of a file while *Append* allows you to add another file from tape to the text already in the buffer (very useful for dealing with standard text and for merging programs)

Verify checks that your text has been saved successfully before you delete your file and is an essential part of any serious text processor As the program contains a useful *Auto retry* mechanism it does not crash if you start to playback in the middle of a file so rewinding the tape to the start every time is not necessary

Calling *Words* displays the number of words and lines in the current file The final command is *Format* which takes you to the second (format) menu which is concerned with arranging text for printout

When you press 'C' to create your first file the screen clears to buff A black L-shaped cursor flashes in the top left-hand corner next to a small black square which marks the end of the file

Instead of the normal very limited 32 columns by 16 lines display of the Dragon with inverse graphics to represent lower case a much more useful 51 column by 24 lines display with true lower-case appears magically before your eyes! With

```
Right Arrow = cursor to end of line
Left Arrow  = cursor to beginning of line

   = embedded format code
 / = underline delimiter for RX-80 only
 ! ? = user definable control codes

MAIN MENU COMMANDS (one key)

 C = Create new text file (destroys old)
 E = Jump back to Editor (non destructive)
 S = Save all text in buffer to tape
 % = Save marked block of text to tape
 R = Read in text file from tape
 A = Append text file from tape to end of buffer
 V = Verify (Skip)! Skip to end of file on tape
 F = Jump to Print Format menu
 W = Word and line count for all or part of text

EPSON FONT TABLE

 0 = clear special fonts (normal font)
   = emphasized (ESC E)
 2 = double (ESC G)
 3 = condensed (SI)
 4   only ... (SO)
```



out doubt this feature alone puts *Telewriter* streets ahead of any of other word-processing program for the Dragon that we have seen. The display is quite clear, but looks even better if you turn down the colour on your tv to give black and white. Even on an ancient 12in black and white portable, which we were using while writing this review, the picture was crystal clear. Shift 0 switches between upper and lower-case, but holding shift down in lower case mode also produces upper case as on a normal typewriter.

Streets ahead

If you continue to type, wordwrap will occur when you exceed 50 columns, so that words are not broken. Text is always inserted at the current cursor position, which can be moved one character or line in the appropriate direction with the four arrow keys. If shift is held down at the same time as a cursor key, auto repeat enables you to move faster through the file, and scrolls the screen if the top or bottom is reached.

The *Clear* key is redefined as a *Control* key (that is special functions are assigned to other keys if they are pressed at the same time as *Clear*). For example, *Clear* and the arrow keys will move you to the top or bottom of the file, or the start or end of a line, while *Clear P* pages you forward and *Clear* – pages you backwards through the file. A character to the right of the cursor is deleted by *Break*, or a whole line may be killed with *Clear K*.

Global search and replace

When you insert additional text into an existing line, overflow may occur on to a continuation line below the current one, but the text can be simply realigned with *Clear A*. No horizontal screen scroll is provided, but this is not really necessary when you already have 51 rather than 32 characters on a line. If you are entering columns of figures, you will find the *Clear T Tab* function useful.

If block markers are placed at the beginning (*Clear B*) and end (*Clear E*) of a section, *Clear C* will produce a *Block Copy* at the current cursor position. If only the end marker is placed, then *Clear X* will cause a *Block Delete* from the current cursor position to the end marker. *Block Moves* are achieved by combining *Block Copy* and *Block Delete*.

Another very useful control function is *Clear G* for *Global Search and Replace*, which will search the text for any pattern of characters which you define, and then allow you to automatically replace them. *Clear R* gives replacement and *Clear N* moves you to the next occurrence of the pattern. This facility is extremely useful if you want to replace people's names in a letter, or if you cannot face typing something like cyclopentanoperhydrophenanthrene more than once!

If you start to insert text at the start of a long file the system slows down, as the screen has to keep rewriting, but this can be overcome by use of *Speed Mode* which inserts a temporary file end. Finally, *Clear M* returns you to the main menu.

Obviously, you will want to get your words down on to paper at some point. Pressing *F* in the main menu accesses the format menu, where your printing parameters are set. If you now just press *P*, the text will be printed exactly as displayed on the screen (provided of course that you have a printer attached). The different versions of *Telewriter* allow you to use virtually any printer (except the idiosyncratic Sinclair), but even the humble Seikosha GP-100A we use at home costs more than the Dragon.

Line Spacing, *Left Margin*, *Characters Line*, *Upper Margin*, *Lines Page* and *Bottom Margin* can all be specified, and all or part of a file may be printed. The default value for characters line is 50. If this value is increased and *Edit* used to return to the text, most lines will overflow on to continuation lines. This looks a bit messy, but does not stop the program handling lines up to 99 characters long.

In addition, if *Page* is not set to zero, each page is numbered. *Wait* will halt after each page (for single sheets) and *Queue* allows the sequential automatic loading and printing of a series of files on cassette, making the effective memory capacity very high. If you use an Epson printer, then any of the four available founts can be called. The final items on the format menu are *Direct*, which allows you to send Ascii codes straight to the printer, and *Typewriter* which sends text to the printer when you press *Enter*.

Another feature usually only found on full scale word processing programs is *Embedded Codes*, which can be placed in the body of the text to modify printout at that point. *Format Codes* can change any of the normal parameters to give indented, respaced or emphasised text etc, while *New Page* automatically moves the printer on to the top of the next page. *Centering* of lines is supported and a *Header* (heading) can be printed at the top of every page. Finally, use of *Define Direct* lines at the start of a file means that special control codes (up to 15 characters long) can easily be inserted anywhere in the text.

Basic programs saved in the normal manner are not compatible with *Telewriter*, so conversion is needed. To get Basic into the correct form, you first need to save the program as an Ascii dump by *Csave filename A*. The *Convert* program on the Microdeal tape is then loaded and the Ascii dump read in and converted to a new machine-code file which is compatible with *Telewriter*. *Convert* also works in the opposite direction, to make Basic compatible Ascii dumps of programs written within *Telewriter*.

This method enables you to have a full screen editor which has all the functions (like line swap, replace and copy) which you wish had been included in the normal Dragon editor. You can also use it to merge programs via *Append*, or to include actual program lines in documentation. Although you can write Basic in *Telewriter* you have to be a little careful about entering all your lines correctly. And as you cannot Run the program within *Telewriter* you will have to finally debug it later.

The only things obviously missing from *Telewriter* are justification (alignment) of the right hand margin, so that the output appears typed rather than in true printed form, and an on screen word, line and page status display. If these particular features are of over-riding importance, then you must look elsewhere, but you are going to have to do without a lot of other important features if you opt for one of the other Dragon word processing packages.

Conclusion

Telewriter is undoubtedly a real word processor which provides an excellent tool for the serious Dragon user. It is suitable for the small business, or the professional writer, as well as taking care of home word-processing chores (if you can't imagine a home word-processing chore you should watch three kids fighting to be first to use it for their English homework). We are used to *Wordstar* on a Superbrain but have not noticed that much practical capability has been lost in coming down to this level. The price may look steep at first, but you really must compare it with something like the Wordcraft Rompac for the Vic20, which at £125 for fewer facilities no longer looks much of a bargain. Also, a disc version is under development for those who require greater storage capacity and more rapid access to records.

Telewriter is a highly recommended package which demonstrates the potential of the Dragon as a serious machine.


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Strikers Revenge

on Vic20

This original game takes place outside a factory. Unfortunately two of your workers are standing on the roof throwing 'things' at you. You (the boss) and a director have the skilled job of catching the dropped items and then running to the waiting lorry on the left which will drive off.

You must then move back and catch more — BUT there are only two minutes to grab as many as possible and you are only allowed to drop five things. If you manage to catch twenty you can get your revenge (on the workers) by Firing Them!

It is not as easy as it sounds — so why not try it? Movement instructions are in the program. Beware, things speed up!

Program notes

5-30 Sets variables
35-65 User defined graphics
70-130 Screen display
135-165 Decides what is thrown and by which man
170-200 Pokes the 'things' on to the screen
205-215 Checks if object is caught.
230-245 Checks keyboard, prints man
250-255 Dropped object
260-290 Caught object
295-320 Ending remarks
325-425 Sets up next screen
430-475 Instructions

Main variables

M = Tabulation for printing men
M$ = String for printing the man
L0$-L2$ = Various lorry strings
PO = Position of object
D = Amount of objects dropped
SC = Score

```
[illegible]
```

Strikers Revenge
by Simon Tweed

Luner Lander

on Dragon 32

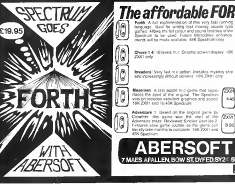
The program as listed is for use with a joystick. To change the game to play with the UP LEFT RIGHT arrowed keys add change

```
130 I$=INKEY$:IF I$=CHR$(8) THEN CS=0 ELSE
    IF I$=CHR$(9) THEN CS=63
151 IF I$=CHR$(94) THEN C2=0
152 IF I$=  THEN CS=45:C2=45
860 IF INKEY$=  THEN 860
```

Change instructions from line 830 onwards to use the arrowed keys and the space bar to turn off engines. The Rem lines explain how the program works.

```
[illegible]
```

Turn to page 19



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Sparkle
on Dragon 32

This program is designed to work on a Dragon 32 It uses the standard graphics characters available on the Dragon to give an impressive kaleidoscopic effect using most of the available colour set when using the text screen

The program gives an endless display of colourful symmetrical patterns

L=Length of one li
G=First number of
A$=Graphics strin

Program notes

2 5 Clears screen se
7 Selects random c
9 Changes directio
16 17 Displays full grap
19 Returns to start o

```
1 REM SPARKLE
2 CLS
```

From page 15

```
500 IF PPOINT(A1+8,H+12)=2 OR PPOINT(A1+28,H+12)=2 THEN 800
530 GOTO 360
540 IF PPOINT(P1+2,H+12)=2 OR PPOINT(P1+2,H+12)=2 THEN T=4 GOTO 800
550 GOTO 380
560 FOR W=1 TO 48 STEP 3 PP$="O1T50V"+STR$(INT((W+1)/2))+CHR$(INT((W+1)/10)+1)+64) PLAY PP$
570 CIRCLE(P1+12,H+4),W/4,4
580 NEXTW
590 FOR DD=1 TO 500:NEXTDD:GOTO140
600 IF PT<BT THEN BT=PT
610 CLS PRINT@384 "WELL DONE" PP$=1TO7 PLAY "L500A4BCDEFG":NEXTDD:PRINT@418 "TIME = "PT" BEST TIME = "BT
620 PRINT:PRINT"PRESS JOYSTICK BUTTON ?"
630 IF PEEK(65280)AND1=1 THEN 630
640 GOTO140
650 COLOR2,3 H=2 PCLS LINE(X,Y)-(X,Y),PSET
660 X=X+RND(25) IF X>255 THEN X=255
670 Y1=RND(40)-20 IF Y+Y1>190 OR Y+Y1<70 THEN 670
680 Y=Y+Y1
690 SOUND 200,1 LINE-(X,Y1),PSET
700 IF X<255 THEN 660 ELSE PAINT(10,192),2,2
710 COLOR4 LINE(X,Y)-(255,191),PSET BF COLOR2,3
720 RESTORE
730 FOR RR=0 TO 4 FOR R5=0TO3 READ XX POKE 1536+R5+32*RR,XX NEXTR5 RR
740 FOR RR=0 TO 4 FOR R5=0TO3 READ XX POKE 1545+R5+32*RR,XX NEXTR5 RR
750 FOR RR=1 TO 30 PSET(RND(255),RND(190)+1,5) NEXTRR
760 RETURN
770 COLOR4 LINE(36,0)-(100,4),PSET BF COLOR3 IF C<10 THEN DRAW"C2BM148,8L1D8R4U8;L1D1B8M TU1L1"
780 IF C<55 THEN DRAW"C2BM148,8R8L3U8L1U1B8M44U14"
790 IF C<71 THEN DRAW"C2BM138,8R4D1L2D1BL1B8L1BR9L1BL3R2L1U1"
800 RETURN
810 CLS PRINT"         LUNAR LANDER
820 PRINT STRING$(32,131) STRING$(32,131)
830 PRINT PRINT"USE THE JOYSTICK TO CONTROL THE LANDER  THE POWER IS INCREASED THE FURTHER UP THE JOYSTICK IS"
840 PRINT PRINT"A HIGH PITCHED BEEP MEANS YOU ARE   LOW ON FUEL  THIS SWITCHES TO A HIGHER PITCH WHEN YOU RUN OUT OF FUEL   PRINT PRINT"PRESS JOYSTICK BUTTON TO START"
850 PLAY"T7O4V31CDEFGCDEFGDACDEFGCDEFGDCDEFGCDEFG"
860 IF PEEK(65280)AND1=1 THEN 860
870 CLS PRINT@480 "GOOD LUCK"
880 FOR I=1 TO 8 FOR DD=1TO50 NEXTDD PRINT NEXTI PLAY "T60O5CFEDCCFEDCCAGFEDCCFEDCCFEDCCFEDCCFEDCCFEDC"
890 FORDD=1TO500 NEXTDD GOTO50
900 DATA 87 119 87 127
910 DATA 127 119 127 127
920 DATA 95 119 95 127
930 DATA 127 119 127 127
940 DATA 127 87 87 87
950 DATA 87 125 213 247 120 213
960 DATA 127 93 223 247 93 223
970 DATA 95 93 223 247 93 215
980 DATA 127 117 221 247 117 223
990 DATA 87 117 213 247 117 213
```

Lunar Landing
by Brian Cadge

Sparkle

on Dragon 32

This program is designed to work on a Dragon 32. It uses the standard graphics characters available on the Dragon to give an impressive kaleidoscopic effect using most of the available colour set when using the text screen.

The program gives an endless display of colourful symmetrical patterns.

Main variables

A=Centre of design
L=Length of one line on the screen
G=First number of graphics available
A$=Graphics string

Program notes

2-5	Clears screen sets variables
7	Selects random graphics and random colour
9	Changes direction of display
10-17	Displays full graphic screen
18	Returns to start next pattern

```
1 REM SPARKLE
2 CLS
3 A=252 D=-1
4 W=4 S=7 L=32 M=22 G=121
5 DIM R$(8)
6 FOR J=0 TO 5 A$="" FOR K=1 TO N
7 A$=A$+CHR$(RND(M)+G+(RND(7)*16))
  NEXT
8 R$(J)=A$ NEXT
9 D=-D
10 P=0 Q=3 IF D=0 THEN Q=0 P=S
11 FOR K=P TO Q STEP D
12 FOR J=K TO Q STEP D
13 PRINT@A+J*W+K*L,R$(K) PRINT@A
   +K*W+J*L,R$(K)
14 PRINT@A+J*W-K*L,R$(K) PRINT@A
   +K*W-J*L,R$(K)
15 PRINT@A-J*W+K*L,R$(K) PRINT@A-
   K*W+J*L,R$(K)
16 PRINT@A-J*W-K*L,R$(K) PRINT@A-
   K*W-J*L,R$(K)
17 NEXT NEXT
18 GOTO 6
```

by C Trigg

World

on ZX81

The World is for ZX81 with Rampack. It is quite straightforward to input and can be printed on the ZX Printer using *Copy* or by changing the *Print* statements to *Lprint*. The map occupies 20 lines of the display so that the bottom 2 lines can be used for titles or possibly time zones.

Readers may wish to try scrolling the picture to the left using string slicing or machine code methods. Spectrum owners can experiment with colour to show different continents and perhaps use a blue background for the sea.

A competition could easily be based on these ideas.

```
10 REM THE WORLD BY D.H.COX
20 DIM U$(20,32)
30 LET U$(1)=
40 LET U$(2)=
50 LET U$(3)=
60 LET U$(4)=
70 LET U$(5)=
80 LET U$(6)=
90 LET U$(7)=
100 LET U$(8)=
110 LET U$(9)=
120 LET U$(10)=
130 LET U$(11)=
140 LET U$(12)=
150 LET U$(13)=
160 LET U$(14)=
170 LET U$(15)=
180 LET U$(16)=
190 LET U$(17)=
200 LET U$(18)=
210 LET U$(19)=
220 LET U$(20)=
250 FOR L=1 TO 20
260 PRINT U$(L)
270 NEXT L
280 PRINT "THE WORLD"
```



The World
by D Cox

Jaws

on BBC Micro

In this game you are given 3 ships and have 30 missiles to fire. The deadly shark will move across the screen gradually moving down whilst dropping ravenous babies on you from time to time. The game ends when you either run out of missiles lose all your ships or the shark gets to the sea bed and gobbles you up.

At the end of the game you are given a suitable comment on your score.

Program notes

This program works mainly with *Procs* and *Defprocs*. The shark is printed at lines 220 and 230 using (A,B). A$ and B$ are the variables that draw the shark. D is the position of the base.

```
10 REM ***** W E E B J A W S *****
12 REM ***** BY JAMES SCHUMANN ***
14 REM ***** AGE 11 YEARS ********
15 REM ***** FOR THE BBC MICRO ***
17 REM ***** MODELS A OR B *******
20 MODE7:PRINT:PRINTCHR$170,CHR$141 J     A     W     S :PRINTCHR$170;CHR$141
J     A     W     S :PRINT:PRINT
30 PRINTCHR$172"You control a moving missile base at" PRINTCHR$132"the bottom
of the Atlantic Ocean.The" PRINTCHR$172"area you are in is teeming with sharks'
PRINTCHR$172"You have 30 missiles,and you must wipe
40 PRINTCHR$172"out as many as you can   PRINTCHR$172"But be careful! the sha
rk might drop "PRINTCHR$172"one of it's babies on you'':PRINT:PRINTCHR$173"Use
"Z" to move left   "Z" to go right  PRINTCHR$133"Use "M" to fire .PRINT
45PRINTCHR$134"PRESS  SPACE TO START"
50 G$=GET$:IF G$=" " THEN 1010:ELSE 50
1010 A=2:B=10:D=16:C=1:A$=[illegible]:B$=[illegible]:DS=0:MI=30:G=14:SH=3
1020 REM******SET UP GRAPHICS********
1030 MODE
1040 PRINTTAB(6,5);CHR$133"SHIPS
1050 FOR I=1TO SH:PRINTTAB(G,5);CHR$149 [illegible]:G=G+5:NEXT I
1060 PRINTTAB(6,2);CHR$129:CHR$141;'J  *  A  *  W  *  S  :PRINTTAB(6,3);CHR$129
CHR$141;'J  *  A  *  W  *  S
1070 PRINTTAB(1,21);CHR$1[illegible]   [] [] [] [] [] [] [] [] []
1080 PRINTTAB(6,23)CHR$130"MISSILES=";MI
1085 IF MI 10 THEN PRINTTAB(17,23)" "
1090 PRINTTAB(20,23)CHR$131"DEAD SHARKS=";DS
1100 PRINTTAB(D,20);CHR$145 [illegible]
1110 PRINTTAB(A,B);CHR$146;A$
1120 PRINTTAB(A,B+1);CHR$146;B$
1130 SOUND 2,-10,20,1
1140 REM**********SET UP KEYS*********
1150 I$=INKEY$(0)
1160 IF I$="Z" THEN PRINTTAB(D,20)" "   ":D=D-2
1170 IF I$="X" THEN PRINTTAB(D,20)"     ":D=D+2
1180 IF MI=0 THEN PROCAMMEND
1190 IF D 2 THEN D=2
1200 IF D 30 THEN D=30
1210 IF I$="M" THEN PROCFIRE
1220 IF RND(10)=1 THEN PROCBABY
1230 IF A=21 AND B=18 THEN PROCEAT
1240 PRINTTAB(1,B);
1250 PRINTTAB(1,B+1);
1260 A=A+C
1270 IF A=30 THEN B=B+1:A$=[illegible]:B$=[illegible]:C=-1
1280 IF A 1 THEN B=B+1:A$=[illegible]:B$=[illegible]:C=1
1290 GOTO 1060
1300 REM*****************************
1310 DEFPROCFIRE
1320 MI=MI-1
1330 F=19
1340 PRINTTAB(D+2,F)
1350 FOR Z=1TO70:NEXT
1360 PRINTTAB(D+2,F)
1370 F=F-1
1380 IF F=B+1 AND D=A THEN PROCSPLAT
1390 IF F 9 THEN ENDPROC
1400 GOTO 1340
1410 ENDPROC
1420 REM******************************
1430 DEFPROCBABY
1440 G=14
1450 T=2
1460 PRINTTAB(A,B+T);CHR$171"oo"
1470 IF T+B=21 AND A=D OR T+B=21 AND A=D-1 OR T+B=21 AND A=D+1 THEN SH=SH-1:SOU
ND [illegible] 14[illegible]:PRINTTAB(10,5)[illegible]   .PRINTTAB(6,5);CHR$133"SHIPS
FOR I=1TO SH:PRINTTAB(G,5);CHR$149 [illegible]:G=G+5:NEXT I :IF SH=0 THEN PROCEAT
1480 IF T+B 21 THEN ENDPROC
1490 FOR X=1TO50:NEXT
1500 PRINTTAB(A,B+T)
1510 T=T+1
```

```
15.0 GOTO 1460
1 [illegible] REM*********************************
1540 DEFPRCLEAT
1550 CLS:PRINT:PRINTCHR$129:CHR$134:CHR$141"G A M E   O V E R"
1560 PRINTCHR$129:CHR$136:CHR$141"G A M E   O V E R"
1[illegible] FOR J=1TO200:SOUND RND(7),-15,RND(254),1:NEXT
1580 SOUND 0,-15,40,20:CLS
1590 PRINT:PRINTCHR$127"Y O U   H A V E   B E E N   M U N C H E D"
1[illegible] ENDPROC
1[illegible] REM*********************************
1[illegible] DEFPROCSFLAT
1[illegible] D=D+1
1[illegible] I=1
1[illegible] FOR LO=1TO50:SOUND RND(7),-15,RND(255),1:NEXT
1[illegible] PRINTTAB(A,B+N)
1[illegible] PRINTTAB(A,B+N-1)
1[illegible] IFN<1
1[illegible] PRINTTAB(A,B+N);CHR$146;A$
1[illegible] PRINTTAB(A,B+N+1);CHR$146;B$
1[illegible] FOR LFN=1TO50:NEXT
17[illegible] IF N+B=20 THEN SOUND 0,-15,10,10:A=3:B=10:ENDPROC
1[illegible] GOTO 166[illegible]
1[illegible] DEFPROCAMMEND
1[illegible] CLS:FORLO=1TO100:SOUND RND(4),-15,RND(255),1:NEXT CO
1760 PRINT:PRINTCHR$130"YOU HAVE RUN OUT OF AMMUNITION [illegible]":PRINT:PRINTCHR$1
[illegible] The sharks have all come down and":PRINTCHR$131"gobbled you up [illegible]":PRINT:PRINT
1770 FOR J=1TO500:NEXT:PRINTCHR$133:CHR$141"R . I . P":PRINTCHR$133:CHR$141"R
 . I . P"
1[illegible]
1[illegible] SOUND 1,-15,2,15:FOR G=1TO2200:NEXT:SOUND 1,-15,0,15:FOR G=1TO2400:N
EXT:SOUND 1,-15,2,3:FOR G=1TO800:NEXT:SOUND 1,-15,2,25
1[illegible] FOR LOP=1TO5000:NEXT
1[illegible] IF I=7 THEN PROCRATE
1[illegible] GOTO 1[illegible]90
1[illegible] REM*********************************
1[illegible] DEFPROCRATE
1[illegible] PRINT:PRINT:PRINTCHR$129"YOUR RATING IS:
1[illegible] IF DS[illegible]30 THEN PRINT"ARE YOU A ROBOT PROGRAMMED PERFECTLY?":GOTO 1970
1[illegible] IF DS[illegible]20 THEN PRINT"WHY DON'T YOU JOIN THE NAVY?":GOTO 1930
1[illegible] IF DS[illegible]10 THEN PRINT"YOU'VE PLAYED THIS GAME BEFORE":GOTO 1930
1[illegible] IF DS[illegible] THEN PRINT"NOT TOO BAD":GOTO 1930
1[illegible] IF DS[illegible]4 THEN PRINT"NOT TOO HOT":GOTO 1930
1[illegible] IF DS[illegible] THEN PRINT"I SUGGEST THE DOCTOR":GOTO 1970
1[illegible] IF DS[illegible] THEN PRINT"SELL THE COMPUTER":GOTO 1970
1[illegible] PRINT:PRINTCHR$131"ANOTHER GAME Y/N ?":INPUT A$:IF A$="Y" THEN RUN
1[illegible] IF A$="N" THEN END
1[illegible] GOTO 1970
```

Jaws
by James Schuman

Find the Crook

on Spectrum

Your task is to identify a wanted criminal hiding among a crowd and to arrest him. A reward of $17 500 is given for your help. But you must act quickly as the reward decreases with time.

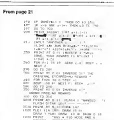
BEWARE! Do not shoot an innocent person.

10-85	Define user graphics
91-92	Select level of difficulty
94-160	Initialization (drawing the faces, timer etc)
170-190	Main loop (reading the keys, control the time etc)
195-360	Ending
1000-1190	Instructions

```
5 PAPER 0: BORDER 0: BRIGHT 1: INK 7: CLS
10 FOR F=USR "a" TO USR [illegible]+7: READ a: POKE F,a: NEXT F
20 DATA 126,255,219,[illegible],255,219,231,126
30 DATA 126,[illegible],219,[illegible],255,1[illegible],255,126
40 DATA 126,[illegible],219,[illegible],[illegible],[illegible],[illegible],126
50 DATA 126,219,[illegible],255,219,[illegible],1[illegible]
60 DATA [illegible],[illegible],255,231,[illegible],1[illegible],[illegible],1[illegible]
70 DATA 126,[illegible],[illegible],[illegible],[illegible],[illegible],[illegible],126
75 RUN 1000
80 LET F$=CHR$ 144+ CHR$ 145 + CHR$ 146+ CHR$ 14[illegible] + CHR$ 14[illegible]
82 RESTORE [illegible]
83 LET [illegible]=1750: LET [illegible]=10: LET [illegible]=1
91 INPUT "Skill level [illegible]";[illegible]: IF [illegible]
   OR [illegible] 10 THEN GO TO [illegible]
92 LET [illegible]=[illegible]/10
94 PRINT AT[illegible] [illegible]"WANTED"[illegible]CHR$ 147[illegible]
9[illegible] PRINT "TIME": PLOT [illegible],171: DRAW 176,0
100 FOR [illegible]=1 TO [illegible] STEP [illegible]
110 FOR [illegible]=1 TO 30 STEP 2
120 PRINT AT [illegible]1 INK [illegible]RND*5[illegible]; F$(1+INT (RND*5))
130 NEXT [illegible]: NEXT [illegible]
140 LET [illegible]=2+INT(RND*[illegible])*2
150 LET [illegible]=INT (RND*15)*2 +1
160 PRINT AT [illegible] INK [illegible];CHR$ 147
170 PRINT AT [illegible]
175 LET [illegible]: BEEP [illegible] TO 1/10
[illegible]SE [illegible]+1 171[illegible] IF [illegible]=0 THEN GO TO [illegible]
180 PRINT AT [illegible]
182 LET [illegible]+2*(INKEY$="8" AND [illegible])-
   2*(INKEY$="5" AND [illegible])
185 LET y=y+2*(INKEY$="6" AND
   [illegible])-2*(INKEY$="7" AND [illegible])
```

Turn to page 23

From page 21



```
150 IF INKEY$<>"" THEN GO TO 150
190 IF x=b AND a=y THEN GO TO 300
197 GO TO 350
200 PRINT BRIGHT 1;AT a+1,b-1;
     "   "AT a,b-1;"   ";AT a,b+1;"  ";
     AT a-1,b-1;"   "
210 INPUT "ANOTHER ..."
    (LINE a$: RUN 8*(a$="n")+(a$<>"n")
    (a$="n")+210*(a$<>"n")+(a$="N")
250 PRINT AT 0,0; INVERSE 1;"WELL
    DONE. YOUR REWARD IS £";INT (
    1/0*t +.5)
260 FOR F=1 TO 19: READ c,d: BEEP c,d:
    NEXT F
270 GO TO 200
300 PRINT AT 0,0; INVERSE 1;" THE
    CRIMINAL ESCAPED-NO REWARD "
310 FOR F=20 TO 0 STEP -1
320 BEEP .08,F: NEXT F: BEEP .5,0
330 GO TO 200
350 PRINT AT 0,0; INVERSE 1;"
  WRONG FACE NO REWARD         "
360 GO TO 310
1000 PRINT AT 0,11; FLASH 1;"WANTED  ";
     FLASH 0;TAB 10;"--- -----"
1010 PRINT AT 8,16;CHR$ 147
1020 PLOT 118,109: DRAW 18,0:
     DRAW 0,-18: DRAW -18,0: DRAW 0,18
1030 PRINT "   HAS A BIG NOSE AND A
     NARROW   FOREHEAD ALWAYS SMILING "
```

PROGRAM OF THE WEEK

```
"   BEWARE HE MIGHT BE DISGUISED
IN"   ANY COLOUR
1040 PRINT "   PRESS ANY KEY TO
     CONTINUE "
1050 PAUSE 0: CLS
1060 PRINT "THERE IS A REWARD
 OF £17000" "FOR YOUR HELP-BUT
 BE QUICK,IT" "DECREASES WITH
 TIME "
1070 PRINT "USE KEYS ""5"" ""6""
 ""7"" AND ""8"" TO SEARCH FOR HIM
 AND KEY ""0 "" TO ARREST HIM."
1080 PRINT TAB 10;"GOOD LUCK "
1090 PRINT "    PRESS ANY KEY
 TO START"
1095 PAUSE 0
1100 RUN 50
9000 DATA ...
9010 DATA ...
```

Find the Crook
by Tomer Ilan

Pencil

on ZX81

This program was inadvertantly omitted from *Popular Computing Weekly* February 24 — March 2. It is a multiplication routine which can multiply two 14 digit numbers accurately rather than rounding off the answer to the nearest eight digits.

The task was complicated because no functions such as *Val* could be applied to numbers greater than eight figures as they would be rounded off. The solution was to hold the relevant numbers in strings together with simple variables set to the same length as the appropriate strings. This program for a ZX81 can be Run in *Fast* but this will prevent you from seeing the computer arrive at the answer digit by digit.

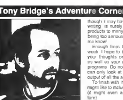
```
* LONG MULTIPLICATION *
PRESS NEWLINE 32749581864327 X
               65436918762654
FOR NEXT SUM
        130998532486573285
        1637479053216
        19643748638596
        ...
        19643748635962
        ...
        2619955461451610
        3274958186432 7
        294746229857 3463
        65499163129654
        98248743192 981
        130998532465 7396
        16374790532 1636
        19649748635962
     ----------------------
   2142988772 93268 3192 1894 2858
   ============================
```

```
10 REM * LONG MULTIPLICATION *
20 REM * W R GOOGE       1983 *
30 REM
40 PRINT AT 1,5,"* LONG MULTIP
LICATION *"
50 PRINT AT 3,2,"ENTER MULTIPL
ICAND"
55 PRINT AT 5,2,"LESS THAN 15
DIGITS PLEASE"
60 INPUT A$
70 LET A$=A$
75 PRINT AT 21,0
80 GOSUB 140
90 PRINT AT 7,2,"ENTER MULTIPL
IER"
95 PRINT AT 9,2,"LESS THAN 15
DIGITS PLEASE"
100 INPUT B$
110 LET B$=B$
115 PRINT AT 21,0
120 GOSUB 140
130 GOTO 210
140 FOR N=1 TO LEN A$
150 IF CODE A$(N)<28 OR CODE A$
(N)>37 THEN GOTO 180
160 NEXT N
170 RETURN
180 PRINT AT 21,0,"INCORRECT DA
TA ";A$( TO N)
190 IF A$=A$ THEN GOTO 50
200 GOTO 90
210 PRINT AT 11,0,A$;" X ";B$
220 PRINT AT 13,2,"IS THAT CORR
ECT ?? (Y OR N)"
230 INPUT C$
240 IF NOT (C$="Y" OR C$="N") T
HEN GOTO 230
250 IF C$="N" THEN GOTO 270
260 GOTO 290
270 CLS
280 GOTO 40
290 CLS
300 LET A=LEN A$
310 LET B=LEN B$
320 PRINT "  * LONG MULTIPLICATIO
N *"
330 PRINT AT 2,28-A,A$;" X"
340 PRINT AT 3,28-B,B$
350 FOR N=1 TO A+1
360 PRINT AT 4,28-N,"-"
370 NEXT N
380 DIM D$(B,A+B)
390 FOR N=B TO 1 STEP -1
400 LET C=0
410 FOR M=A TO 1 STEP -1
420 LET P=VAL A$(M)*VAL B$(N)+C
430 LET Q=INT (P/10)*10
440 LET R=P-Q
450 LET D$(N,M+1)=STR$ R
460 PRINT AT 5+(B-N),28-(A-M+1+
B-N),R
470 LET C=Q/10
480 NEXT M
490 IF C<>0 THEN PRINT AT 5+(B-
N),28-(A+1+B-N),C
500 LET D$(N,1)=STR$ C
510 NEXT N
520 FOR N=B TO 1 STEP -1
530 IF B=N THEN GOTO 600
540 LET X=0
545 LET Y=0
550 LET D$(N,A+2+Y)="0"
560 LET X=X+1
570 IF X=B-N THEN GOTO 600
580 LET Y=Y+1
590 GOTO 550
600 NEXT N
610 FOR N=B TO 1 STEP -1
620 IF D$(N,LEN D$(N))<>" " THE
N GOTO 650
630 LET D$(N)="0"+D$(N)
640 GOTO 600
650 NEXT N
660 IF B=1 THEN GOTO 710
670 FOR N=1 TO A+B+1
680 PRINT AT 5+B,28-N,"-"
690 NEXT N
700 GOTO 730
710 FOR N=1 TO A+1
720 PRINT AT 6,28-N,"="
730 NEXT N
735 GOTO 890
740 LET C=0
745 FOR N=LEN D$(1) TO 1 STEP
-1
750 LET P=0
760 FOR M=B TO 1 STEP -1
770 LET P=P+VAL D$(M,N)
780 NEXT M
785 LET P=P+C
790 LET Q=INT (P/10)*10
800 LET R=P-Q
810 PRINT AT 6+B,27-(LEN D$(1)-
N),R
820 LET C=Q/10
830 NEXT N
840 IF C=0 THEN GOTO 860
850 PRINT AT 6+B,27-N,C
860 FOR N=1 TO LEN D$(1)+1
870 PRINT AT 7+B,28-N,"="
880 NEXT N
890 PRINT AT 2,0,"PRESS NEWLINE"
900 PRINT AT 4,0,"FOR NEXT SUM"
910 INPUT C$
920 IF NOT C$="" THEN GOTO 910
930 CLS
940 GOTO 40
950 SAVE "SUM"
960 RUN
```

```
      * LONG MULTIPLICATION *
  ENTER MULTIPLICAND
  LESS THAN 15 DIGITS PLEASE
  ENTER MULTIPLIER
  LESS THAN 15 DIGITS PLEASE
34567 X 456
  IS THAT CORRECT ??  (Y OR N)
```

```
* LONG MULTIPLICATION *
PRESS NEWLINE            34567 X
                           456
                        ------
FOR NEXT SUM            207402
                       172830
                      138268
                      --------
                      15762552
                      ========
```

Pencil
by W Googe



All you need is love

Last week I reviewed *The Hobbit*, a new adventure for the Spectrum from Melbourne House. This week let's have a look at the ZX81, a machine that refuses to lay down and be surpassed by its fleshy big brother, the Spectrum.

The ZX81 is ideally suited to text adventures — although many programs now include graphics, with varying degrees of success. In the future I will be looking at adventures that I think succeed in one way or another.

For the moment, though, a little gripe! Remsoft of Brighton recently released an adventure called *Love*. The program is a fairly ordinary adventure, with the computer recognising some 200 words. But it differs from other adventures in two important ways. First of all, the protagonist is understood to be female, and second, the computer responds to emotional words such as *kiss*, *cry* and so on, rather than the more conventional, active commands like *bash*, *stab* or *spell*.

The authors, apparently are female Ms Bollen and Ms McEwen have written an adventure of which most feminists would not approve. The whole atmosphere is charged with the helplessness of the poor female heroine, who can only respond to a situation by swooning or becoming coquettish. I found that even a command to "strip naked" (given, I'm afraid, in a moment of jocularity and frustration) was taken seriously by the computer. In this case the rest of the adventure was undertaken in the nude!

This is all fairly amusing, I suppose, but I wonder if it is doing anybody any good. The original idea of adventure programs is a quest for gold or similar treasure, not some kind of simpering mince through a gauntlet of lechers with unlikely sounding names. In Carnell Software's *Black Crystal*, to use an example, the player may specify his/her sex at the start of the game and the computer will endow the traditional kind of program with the appropriate slant. I think that this is what should be aimed for if sex is to be brought into adventure programs.

Remsoft's cynical approach, humorous though I may have seemed at the time of writing, is surely not going to endear its products to many people. If you think I am being too serious about all this, please let me know!

Enough from the pulpit! As I said last week, I hope to be hearing from you with your thoughts on computer adventuring, as well as your own reviews of favourite programs. Do not hesitate to write in — I can only look at a small part of the total output of all the software houses.

To finish with, here is a location that you might like to include in your own adventure (it might even appear in PCW's adventure):

The player enters a room, in the middle of which stands a large stone tree. A deep stream runs through the room, and on the far side of the tree are three doors.

On the tree hang three candles, which burn with an eerie blue-green flame. If the top candle is extinguished, the resulting smoke renders the player unconscious, to be carried away by elves to another, unknown location.

The smoke from the middle candle allows the player to hear the stream talking, and it may well tell him the correct door to take (the other two doors of course lead him in greater trouble!). The lower candle explodes as the player attempts to snuff out the flame, and a strong Genie appears to do battle with the poor player.

This location could, of course, be adapted so that the candles will react in a random way. The player may also, for instance, jump into the stream upon being attacked by the Genie, and be carried through a door (not necessarily the best one) by the water.

Let us have your ideas on adventure themes, monsters and so on, and remember: *Always call a Balrog "Sir"!*

NB. Entries are coming in thick and fast for *The Hobbit* competition (see *Popular Computing Weekly* March 3-9 for details). The current leader is Peter Batty from Oxford, who has completed 67.5 percent of the adventure. ■

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF.

Cruising Challenge

£10 to be won

Can you beat the new high score?

First there was *Space Invaders*, then there was *Pacman* — now there is *Cruising*. This all action, machine code, arcade type game will test your powers of co-ordination to the limit. Never before has a game asked you to think so quickly, or move so fast.

Achieving a high score on *Cruising* takes considerable skill, and not a little practice. Getting through the first four levels is not easy, and that's just the beginning.

Now you can make that skill work for you. *Popular Computing Weekly* is offering £10 each month to the player with the highest score on *Cruising*. All you have to do to enter this month's competition is send a print out of your highest score, together with your name and address to:

Popular Computing Weekly
Cruising Challenge
Hobhouse Court
19 Whitcomb Street
London WC2 7HF

Each month we will publish the name of the winner and the new *Cruising* high score. Are you good enough to accept the Cruising Challenge?

The highest score sent in so far this month is 6612 from *Julian Downs* of 1 Maple Close, Sawtry, Cambridgeshire. If you have a higher score you could still win this month's £10 — but hurry, entries close on March 31.

Notes

1) Each entry must consist of a ZX printout and your name and address.
2) Closing date for this month's *Cruising Challenge* entries is March 31.
3) The highest score each month will receive £10.
4) High scores cannot be transferred from one month to another.
5) The judges' decision is final.
6) No employees of Sunshine Publications Ltd, or their families, will be eligible to enter the *Cruising Challenge*.
7) *Cruising (on Broadway)* for the 16K and 48K ZX Spectrum is available through W H Smith and leading computer stores for just £4.95. It is also available mail-order from Sunshine Books Ltd, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF.

A period history of the elements

***Alick McWhirter** presents a short routine on the first 20 elements in the Periodic Table*

This program has been designed to Run on the 32K BBC model B but it should be quite easy to convert it to Run on other microcomputers The program tests your knowledge on the first 20 elements of the *Periodic Table* as these are particularly useful for chemistry students

The *Periodic Table* was mainly created by Dimitri Mendeleev (1839 1907) who used the relative atomic mass numbers of the different elements to work out their placing on the table By studying these numbers he was also able to leave gaps for elements which he thought must exist but had not yet been discovered H Mosely is credited with putting the table into its modern form

As stated in the instructions the program will test you on several basic facts about the given elements the number of protons neutrons or electrons the valency which ions are formed or the electronic shell arrangement

For example in the *Periodic Table*, oxygen is element Number 8 because it has 8 protons and 8 electrons in the neutral atom — this is called the relative atomic number

There is a nucleus in the centre of each atom which contains the protons and neutrons Electrons are arranged in different levels or shells around the nucleus Each level must be filled before the next is started

Each element is stable (does not react easily with other elements) if it has its upper shell filled For example neon is very stable having 10 electrons — both the first (2) and second (8) shells are filled

If an element does not have a filled outer shell it can form a compound with another element An element with an almost empty top electron shell may lose an electron (giving it a complete shell) and, in so doing, may give it to another element to complete an almost full shell For example hydrogen comprises one proton and one electron — the first shell is almost empty Oxygen has a filled first shell (two electrons) and six electrons in its second shell — ie oxygen is two electrons short of a complete second shell

To make both the oxygen and hydrogen atoms stable they join up to form water (H_2O) — two hydrogen atoms join with one oxygen atom Each hydrogen atom gives away one electron and becomes stable while the oxygen atoms receive two electrons and also stabilise

```
10MODE6
20VDU19,2,4,0,0,0
30 REM ****************
40 REM *   COFYRIGHT   *
50 REM *      OF       *
60 REM * A.B.MCWHIRTER *
70 REM ****************
80 REM ****************
90 DIM A$(10),E$(21),S$(21,8)
100 CLS
110 RESTORE
120 SC=0:CC=0
130 PRINT:PRINT:PRINT
140 PRINT"*************** ELEMENTS ***************"
150 PRINT"This program has been designed to test "
160PRINT"your knowledge of the first 20 elements"
170 PRINT"of the 'Periodic Table'.  It will test "
180 PRINT"you on one of the following subjects;"
190 PRINT
200 PRINT"                1) Number of protons "
210 PRINT"                2) Number of electrons "
220 PRINT"                3) Number of neutrons "
230 PRINT"                4) The electron arrangement"
240PRINT"               5) The valency"
250PRINT"               6) The ion"
260PRINT
270PRINT"It will ask you 20 questions and at the"
280 PRINT"end it will give you a percentage score"
290PRINT"along with a comment on your perform"
300 PRINT"ance."
310 PRINT
320 PRINT" PRESS RETURN TO CONTINUE..."$:INPUT ZZ$
330 CLS
340 PRINT:PRINT:PRINT
350  PRINT"*************** ELEMENTS ***************"
360 PRINT" The answer to the questions on "
370PRINT"protons, neutrons, electrons and "
380PRINT"valency should be answered by a number;"
```

```
390PRINT"but the ion should be answered for "
400 PRINT"example by 'O--' or 'AL+++' OR '-' if"
410 PRINT"no ion exist.  The electron arrang'"
420 PRINT"should be answered like '2 8 8 1'"
430 PRINT:PRINT:PRINT"PRESS RETURN TO BEGIN...":INPUT ZZ$
440REM PARTS OF ATOMS
450A$(1)="HOW MANY PROTONS IN "
460A$(2)="HOW MANY NEUTRONS IN "
470 A$(3)="HOW MANY ELECTRONS IN "
480 A$(4)="WHAT IS THE ELECTRON ARR' OF "
490 A$(5)="WHAT IS THE VALENCY OF "
500 A$(6)="WHAT IS THE ION OF "
510 FOR I = 1 TO 20:READ E$(I):NEXT I
520 FOR I = 1 TO 20:FOR J = 1 TO 6
530 READ S$(I,J)
540 NEXT J:NEXT I
550 DATA "HYDROGEN","HELIUM","LITHIUM","BERYLIUM","BORON","CARBON","NITROGEN",
"OXYGEN","FLUORINE","NEON","SODIUM","MAGNESIUM","ALUMINIUM","SILICON","PHOSPHORU
S","SULPHUR","CHLORINE","ARGON","POTASSIUM","CALCIUM"
560 DATA "1","0","1","1","1","H+"
570DATA "2","2","2","2","-","-"
580DATA "3","4","3","2 1","1","LI+"
590DATA "4","5","4","2 2","2","BE++"
600DATA "5","6","5","2 3","3","B+++"
610DATA "6","6","6","2 4","4","-"
620DATA "7","7","7","2 5","3","N---"
630DATA "8","8","8","2 6","2","O--"
640DATA "9","10","9","2 7","1","F-"
650DATA "10","10","10","2 8","-","-"
660 DATA "11","12","11","2 8 1","1","NA+"
670 DATA "12","12","12","2 8 2","2","MG++"
680 DATA "13","14","13","2 8 3","3","AL+++"
690 DATA "14","14","14","2 8 4","4","-"
700 DATA "15","16","15","2 8 5","3","P---"
710 DATA "16","16","16","2 8 6","2","S--"
720 DATA "17","18","17","2 8 7","1","CL-"
730 DATA "18","22","18","2 8 8","-","-"
740 DATA "19","20","19","2 8 8 1","1","K+"
750 DATA "20","20","20","2 8 8 2","2","CA++"
760 FOR PP = 1 TO 20
770A =INT(RND(6)):E = INT(RND(20))
780IF A = 0 OR E = 0 THEN 770
790CLS
800PRINT:PRINT:PRINT:PRINT"*************** ELEMENTS ***************"
810PRINT:PRINT:PRINT:PRINT:PRINT:PRINT"          SCORE = ";SC;" / ";CC
820PRINT:PRINT:PRINT:PRINT
830PRINTA$(A):E$(E):INPUT ZZ$:CC=CC+1
840 IF S$(E,A)=ZZ$THENSC=SC+1:PRINT" RIGHT":FOR I = 1 TO 1000:NEXT:GOTO 860
850 PRINT"WRONG ":PRINT"THE ANSWER WAS ";S$(E,A):FOR I = 1 TO 2000:NEXT:GOTO86
0
860NEXT PP
870FOR I = 1 TO 2000:NEXT
880REM RESULTS
890CLS
```

```
190 GETB$:IFB$=""THEN190
200 IFB$="Y"THEND=41031:GOTO220
210 IFB$="N"THEND=64824:SYS64850:GOTO220
215 GOTO190
220 POKE641,0:POKE642,A:POKE643,0:POKE644,B:POKE648,C:SYS(D)
READY.
```

```
260PRINT
270PRINT"It will ask you 20 questions and at the"
280 PRINT"end it will give you a percentage score"
290PRINT"along with a comment on your perform-"
300 PRINT"ance."
310 PRINT
320 PRINT" PRESS RETURN TO CONTINUE..."$:INPUT ZZ$
330 CLS
340 PRINT:PRINT:PRINT
350  PRINT"*************** ELEMENTS ***************"
360 PRINT" The answer to the questions on "
370PRINT"protons, neutrons, electrons and "
380PRINT"valency should be answered by a number!"
```

When is an 8K Vic not an 8K Vic?

***Peter Wilson** explains how you can run unexpanded programs on an expanded Vic20.*

I belong to a computer club. A lot of the members including myself complained that when the Vic's memory was expanded you could not Run some unexpanded programs without removing the extra memory or the Super Expander cartridge.

To overcome this problem, I have written a small program to reconfigure the Vic's memory. When Run the program asks you to press a number between *1* and *6* which sets the relevant *Pokes*. If you press *1* this will reconfigure the Vic so that user Ram starts at 4096, screen Ram at 7680 and colour Ram at 38400. If you press *2* user Ram will start at 1024, screen Ram at 7680 and colour Ram at 38400.

Pressing *3*, *4*, *5* or *6* will reconfigure the Vic so that user Ram starts at 4608, screen Ram at 4096 and colour Ram at 37888. In addition, number 3 sets the Vic's memory at 8K+ without having the extra Ram — a condition that it could not set up on its own.

When this program is executed it sets the Vic as if it had just been turned on and erases the reconfiguration program itself so make a copy before Running it.

One word of warning: do not try to set up a configuration which has Ram missing. For example, if you have an 8K expansion plugged in and you reconfigure to Unexpanded Vic+3K it will show 6655 bytes free but the user Ram will not start at 1024 because you do not have any Ram there.

Try Running this program on an unexpanded Vic and pressing number 6 — you will see what 28159 bytes free looks like. ■

```
RECONFIGURATION


 1 REM RECONFIGURATION
 2 REM  BY P.E.WILSON
 3 REMVIC-PET COMPUTER
 4 REM  CLUB,CORBY.
 10 POKE36879,27:CLR
 20 PRINT" RECONFIGURATION"
 30 PRINT" 1 UNEXPANDED VIC"
 40 PRINT" 2 PLUS 3K"
 50 PRINT" 3 PLUS OK (8K+MEMORY)"
 60 PRINT" 4 PLUS 8K"
 70 PRINT" 5 PLUS 16K"
 80 PRINT" 6 PLUS 24K"
 90 PRINT" PRESS 1 TO 6"
 100 GETA$:IFA$<"1"ORA$>"6"THEN100
 110 IFA$="1"THENA=16:B=30:C=30
 120 IFA$="2"THENA=4:B=30:C=30
 130 IFA$="3"THENA=18:B=32:C=16
 140 IFA$="4"THENA=18:B=64:C=16
 150 IFA$="5"THENA=18:B=96:C=16
 160 IFA$="6"THENA=18:B=128:C=16
 170 PRINT" LEAVE SUPER EXPANDER  FUNCTIONS AVAILABLE?"
 180 PRINT" (Y OR N)"
 190 GETB$:IFB$=""THEN190
 200 IFB$="Y"THEND=41031:GOTO220
 210 IFB$="N"THEND=64824:SYS64850:GOTO220
 215 GOTO190
 220 POKE641,0:POKE642,A:POKE643,0:POKE644,B:POKE648,C:SYS(D)
READY.
```

Designer complete

This is an extract from **Designer** *one of the programs in the chapter on graphics in* The Working Spectrum *a book by David Lawrence published by* **Sunshine Books Ltd** *Hobhouse Court 19 Whitcomb Street London WC2 7HF £5.95 226pp*

Testing Module 3 5 3

If this module is functioning correctly you should be able to RUN the program and initialise the variables Having done this stop the program and enter in direct mode 127 200 and 127 100 as values for X1 Y1 and X2 Y2 These four values should result if you GOTO 1280 in the drawing of a line from the middle of the top edge of the screen to around the middle of the screen

Module 3 5 4

The purpose of this module is to allow the user to move a small cursor around the screen in order to set the start and finish co-ordinates of a line

Commentary

Line 1560 Though the program is capable of shrinking the overall design by any specified factor and rotating it lines can only be input with the design at normal size and unrotated This line sets the angle of the design (ANGLE) and the reduction factor (S) accordingly before calling up the module which draws the part of the design to which the user makes the screen point

Line 1570 You may have noticed that the screen is only 168 pixels high rather than the 176 permitted This is to allow line 21 to be used to display the actual co ordinates of the cursor in relation to the bottom left-hand corner of the overall design

Line 1590 In the course of the program five sets of variables are used at various points to store the same data, namely X Y X1 Y1 X2/Y2 TX1 TY1 and TTX1 TTY2 The simple reason for this is that at times the value of one co-ordinate is altered for some temporary purpose The leading T is an indicator that this is intended as a temporary storage place This line also permits the user to move the window pointed to by the screen after defining the beginning of a line In this way lines may be defined which pass over more than one screen area

Line 1630 Having drawn the specified line the user is invited to confirm it or otherwise If it is confirmed the co-ordinates X1 Y1 and X2 Y2 are stored in two byte form created by FN AS and FN BS in the undefined string AS

Lines 1660-1770 You will recognise this as a fairly standard cursor moving routine One difference is that apart from the cursor keys themselves the keys immediately below them and to the right (TYU1) can be used to move the pixel cursor 10 places at a time thus speeding up the process Pressing 1 causes a return to an earlier part of the module thus defining one of the sets of co-ordinates

Testing Module 3 5 4

By entering a temporary line 1820 with Return and defining 01 and 02 in direct mode as 127 and 83 respectively you should be able to call up this module and move the cursor around the screen define two positions — you cannot yet move the screen in between the start and finish of the line — and see the line displayed for your confirmation or otherwise

Module 3 5 5

It is this module which allows the window represented by the screen to be moved around the design commahd

Commentary

Line 1820 The position of the screen in relation to the design as a whole is defined by setting the position of the centre of the screen Note also that when the program function is 2 only positions with positive co ordinates are available to the user That is the user can only draw lines in parts of the design which have positive addresses

This is because negative addresses cannot be stored in A$ by the two functions FN A$ and FN B$ At other times during the program s execution such as when a design is rotated lines may be created whose ends have negative co-ordinates and these will be printed without problems if the screen window is set to point to them

Line 1840 The borders of the screen are set to match the specified centre of the screen

Lines 1860-1880 Using the function FN A the values stored in AS are trans lated back into numerical coordinates They are translated into positions relative to the centre of the screen window This distance is then multiplied by the scaling factor The co ordinates are then rotated around the centre of the screen through the required angle

Lines 1890 1930 The procedure for moving a point with co-ordinates X and Y through an angle say A is to apply the formula X2 = X*COS A + Y*SIN A and Y1 = − X*SIN A + Y*COS A

Line 1940 The variable Search is used to indicate that the deletion module is to be called

Testing Module 3 5 5

You should now be able to move the screen window over your design and also to move the screen in between the first and second set of co ordinates when defining a line You should also be able to print the overall design or a part of it, at various scales and at various angles

Module 3 5 8

This module draws the line pointed to by the loop variable 1 in the previous module The line is drawn twice with OVER set and the user is then given an opportunity to specify either that the line remains or that the program leaves the module or that the address of the relevant line is removed from AS The line is flashed until one of these inputs is made

Testing Module 3 5 6

You should now be able to delete lines

Summary

This program is a useful tool in a variety of applications given a little imagination You can plan layouts draw maps or simply mess about In fact you can simulate many of the capabilities of more expensive graphics computers beloved of engineers and scientists in many fields

But do not forget that the program is also an example of an easily available techni que applied to the Spectrum The books are there for all of us crammed with powerful ideas that help release the power of your micro

Going Further

1) Could you combine this program with the techniques of shape drawing found in the Tangrams program allowing the start address of certain common shapes to be specified in A$?

2) The program would be more flexible if it made provision to print out text as part of the overall design Once again the co ordinates would need to be stored in A$ ■

Module 3.5 4

```
1530 REM ************************
1540 REM CURSOR
1550 REM ************************
1560 LET ANGLE=0  LET S=1  GO SU
B 1820
1570 PRINT AT 21,18; 0QUIT1DEF2M
OVE ;AT 21,0;"X1=";01;AT 21 8;"Y
1=";02  LET X=01  LET Y=02
1580 GO SUB 1660  IF T$="2" THEN
 GO SUB 1820  PRINT AT 21 18; 0Q
UIT1DEF2MOVE   LET X=01  LET Y=0
2  GO TO 1570
1590 LET TTX1=X  LET TTY1=Y  IF
T$="0" THEN RETURN
1600 PRINT AT 21,0;"X2=";X;"  ";
AT 21,8;"Y2=";Y;"  "; PAUSE 50;
GO SUB 1660; IF T$="2" THEN GO S
UB 1820  PRINT AT 21 18; 0QUIT1D
EF2MOVE   LET X=01  LET Y=02  GO
 TO 1600
1610 IF T$="0"  THEN RETURN
1620 LET X2=X  LET TX2=X  LET Y2
=Y  LET TY2=Y  LET X1=TTX1  LET
Y1=TT[illegible]  LET T[illegible]  LET T[illegible]=Y1
 OVER 1  GO SUB 1280
1630 INPUT "OK? ";Q$; IF Q$="Y"
THEN OVER 0; LET A$=A$+FN A$()+F
N B$()
1640 G[illegible] 1280  OVER 0  PRINT
AT 21 [illegible] AT 21 [illegible]  IF Q$
<> "Y" THEN PLOT OVER 1 [illegible] LEFT
T[illegible]1-BOTTOM+[illegible]  PLOT [illegible]
[illegible]-BOTTOM[illegible]
1[illegible] GO T[illegible] 1560
1[illegible] PLOT BRIGHT 1  OVER 1  LEF
T [illegible]-BOTTOM+[illegible]  PAUSE 2  PLOT BRIG
HT 0  OVER 1 X-LEFT Y-BOTTOM+[illegible]
LET T$=INKEY$  IF T$=[illegible]  THEN GO
TO 16[illegible]
```

```
1670 LET X=X+ T$="5" - T$="5"
1680 LET X=X+10*(T$="8")-10*(T$=
"5")
1690 LET Y=Y+ T$="7" - T$="6"
1700 LET Y=Y+10*(T$="U")-10*(T$=
"J")
1710 IF X>RIGHT THEN LET X=RIGHT
1720 IF X<LEFT THEN LET X=LEFT
1730 IF Y>TOP THEN LET Y=TOP
1740 IF Y<BOTTOM THEN LET Y=BOTT
OM
1750 IF T$="1" THEN PLOT OVER 1;
X-LEFT,Y-BOTTOM+8: RET RN
1755 IF T$="0" OR T$="2" THEN RE
TURN
1760 PRINT AT 21,3;X; AT 21
,11;Y
1770 GO TO 1660
```

Module 3 5 5

```
1780 REM ************************
1790 REM ROTATE
1800 REM ************************
1810 INPUT "ANGLE" ANGLE: LET A
NGLE=ANGLE*PI/180: INPUT "SCALE
FACTOR? ";S: IF S=0 THEN LET S=1
1820 INPUT "CO-ORDINATES OF ORIG
IN? ";O1,O2: IF Z$="C" AND O1<127
 THEN LET O1=127
1830 IF Z$="2" AND O2<83 THEN LE
T O2=83
1840 LET LEFT=O1-127: LET BOTTOM
=O2-83: LET RIGHT=LEFT+255: LET
TOP=BOTTOM+167
1850 CLS
1860 FOR I=2 TO LEN A$ STEP 8
1870 IF I>LEN A$ THEN LET SEARCH
=0: GO TO 1970
1880 LET I1=I: LET X1=(FN A()-O1
)/S: LET I1=I1+2: LET Y1= FN A(
)-O2 /S: LET I1=I1+2: LET X2=(FN
 A()-O1)/S: LET I1=I1+2: LET Y2=(
FN A()-O2)/S
1890 LET TX1=X1: LET TX2=X2: LE
T TY1=Y1: LET TY2=Y2
1900 LET X1=O1+INT (TX1*COS ANGL
E+TY1*SIN ANGLE)
1910 LET X2=O1+INT (TX2*COS ANGL
E+TY2*SIN ANGLE)
1920 LET Y1=O2+INT (-TX1*SIN ANG
LE+TY1*COS ANGLE)
1930 LET Y2=O2+INT (-TX2*SIN ANG
LE+TY2*COS ANGLE)
1940 IF SEARCH=1 THEN OVER 1
1950 GO SUB 1200: IF SEARCH=1 TH
EN GO SUB 1460: IF T$="0" THEN L
ET T$="": LET SEARCH=0: RETURN
1960 NEXT I: LET SEARCH=0
1970 INPUT "ENTER=CONTINUE    CCC
=COPY ";D$
1980 IF D$="CCC" THEN COPY
1990 RETURN
```

Module 3 5 6

```
1460 REM ************************
1470 REM DELETE LINES
1480 REM ************************
1490 PRINT OVER 0;AT 21,0;"YCONF
IRMNDELETEQQUIT": LET OUT=0: OVE
R 1: GO SUB 1200: GO SUB 1200: L
ET T$=INKEY$: IF OUT=1 THEN GO T
O 1510
1500 IF T$<>"Q" AND T$<>"Y" AND
T$<>"N" THEN GO TO 1490
1510 OVER 1: IF T$="Y" OR OUT=1
THEN GO SUB 1200: RETURN
1520 OVER 1: GO SUB 1200: PAUSE
50: OVER 0: LET A$=A$( TO I-1)+A
$(I+8 TO ): LET I=I-8: RETURN
```

Man made

Keith and Steven Brain
explain how to add graphics to your own Dragon games

In our last article we looked at reaction testing and saw how a very simple idea became much more complicated as random factors and on-screen scoring were introduced. However, even at the end we were still only looking for the numbers one and two, which is not exactly mind blowing! Good games always have a story attached to them, so what about converting that program scheme to a war game?

It is always a good idea to include the instructions in the title sequence (line 10). The *Play* command in line 20 is a useful way of causing the program to pause while the instructions are digested.

Adding graphics

Let us consider how to make a low resolution picture of a man, using characters 128 to 143, which consist of black and green blocks in varying arrangements. A black background is necessary, so we must change the default *Cls* command (green) to *Cls0* (black).

The best way to design your figure is to use squared paper (either ordinary graph paper or fancy plotting sheets). Fill in squares to make the figure and divide it into 2 × 2 blocks. You can then work out which characters these correspond to — referring to *Appendix A* of the Dragon manual if necessary — and put these numbers into a grid. If the number required is 128 you will have to find an alternative, as this is the same as the background colour we have set on the screen. For our man, the grid is 3 × 4 and consists of the following characters:

```
 129   135   131
(128)  133  (128)
(128)  142   138
(128)  136   136
```

Graphics characters on the Dragon cannot be called directly from the keyboard and must be accessed via the *Chr$* function. To avoid altering our original program any more than necessary, we will put the new part in a *subroutine* at line 1030. To *Print* the top part of our man at a particular position, we need to:

```
1030 PRINT@B CHR$(129) CHR$(135) CHR$(131)
```

The second row of characters needs to be one line (32 characters) below this, although, as the first character is 128, it is simpler to ignore it and use:

```
1040 PRINT (B+33) CHR$(133)
```

Similarly, the last two rows are produced by:

```
1050 PRINT (B+65) CHR$(142) CHR$(138)
1060 PRINT (B+97) CHR$(136) CHR$(136)
```

You can check what the figure looks like and that you have entered the lines correctly by trying *Goto 1030*. Finally, we must not forget to add a *Return* from the subroutine.

The next problem is working out where on the screen the figure can appear if he is not to find himself blown to pieces as the screen wraps round! We will restrict him to moving horizontally near the centre of the screen, and prevent wrap around by including *B=Rnd(30)+255* in line 110. This forces the figure to be drawn in one of the 30 positions following position 255 (ie, on line 9).

```
110 B RND(30)+255 SOUND255 1 GOSUB1010
```

One of the great problems in combat is recognising your enemy and shooting him quickly without also blowing your mates' heads off. So, we will substitute different coloured figures for the numbers one and two, with the green men representing our allies and the yellow peril the enemy.

The yellow and black blocks required each have a character code that is 16 higher than the corresponding green and black block, so this number must be added to each of the *Chr$* functions when *C=2*. There are many ways of doing this, such as by adding another variable to the *Chr$* codes in lines 1030-1060 and setting it to 16 if C=2 or 0 if C=1.

```
1020 IFC 2 THEN G 16 ELSE G 0
1030 PRINT  B CHR$(129+G) CHR$(135+G)
     CHR$(131+G)
1040 PRINT (B 33) CHR$(133+G)
1050 PRINT (B+65) CHR$(142 G)
     CHR$(138+G)
1060 PRINT (B+97) CHR$(136 G)
     CHR$ 136+G) RETURN
```

Your success and failure rate is kept as before with *D* and *E*. The average reaction time is also now updated in 1010 in each cycle.

```
1010 SOUND200 5 E E 1 T (T+TIMER) 2
     GOTO50
```

The logic has had to be modified a little, as success now only comes if you hit a key when the yellow man appears! If you fire at your own man or miss one of the yellow perils, there is a fair random chance that you will lose one of your own men. The length of time for which the figure is displayed is also rather shorter and variable.

Instead of figures, a histogram-type graphic status display has been included in the screen update line 50.

```
50 CLS0 PRINT 31      FORN 0TO E
   PRINTCHR$(149) NEXT
   PRINT 31 CHR$(128)  PRINT 448     FOR
 N  1TO(10 D) PRINTCHR$(133) NEXT
```

Yellow bands appear at the top of the screen to mark the number of enemy killed. The number of times *Chr$(149)* is printed depends on the variable *E*. It is easier to count down than up with a *For Next* loop, as the minimum number of loops is one. Also, the statements *Print31* and *Print@31 Chr$(128)* are required to start the histogram correctly on the left margin of the screen by wiping out the erroneous first block produced at the end of the previous line. Green bands appear more easily via *D* at the bottom to mark your surviving men!

End of game

The end of the game is reached when you have killed all the enemy (*E=10*) or all your men are dead (*D=10*). As your proficiency increases, you can alter these numbers. There is easily room for a display of more than 100 dead enemy.

The win and lose reports (at 3000 and 2000) tell you the final state of the forces and give an assessment of your average reaction time. This is kept to two decimal places by means of the *Print Using "###.##"* T Print formatting command.

Now that we have seen how simple graphics can be produced and introduced into a game, we are ready to explore moving graphics with cursor and joystick control. See next week. ■

Fig 1 Firing-line flowchart

Fig 2 Constructing the picture of a man from text-screen characters

FULL PROGRAM LISTING

```
5 PEM FIPING LINE COPYPIGHT K & S BPAIN 130283
10 PEM TITLE & INSTRUCTIONS
20 CLS3 PPINT@171 "FIPING LINE". PPINT@257,"PPESS
ANY KEY TO FIRE AT YOUR". PRINT@292."ENEMY - THE
YELLOW PEPIL". PPINT@385."BUT BE SUPE NOT TO
SHOOT YOUP". PPINT@423."GREEN-COATED MATES!";
30 PLAY"T50AGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAG
AGAGAGAGAGAGAGAGAGAGAGAGAGAG"
40 REM SCREEN UPDATE
50 CLS0 PPINT@31 "". FOPN=0TO E PPINTCHP$(149).
NEXT PRINT@31 CHP$(128). PRINT@448."". FOPN=1TO
(10-D) PRINTCHP$(133). NEXT
60 PEM PANDOM TIME AND GPAPNIC COLOUR . CHECK FOP
END OF GAME
70 A=RND(500) C=RND(2).IFD=10THEN2010 ELSE IF
E=10THEN3010
80 PEM INITIAL WAIT TIME COUNTDOWN
90 A=A-1:IFA>0THEN90
100 PEM CHOOSE PRINT POSITION . GOTO TO GRAPHICS
SUBPOUTINE
110 B=RND(30)+255 SOUND255.1 GOSUB1000
119 PEM RANDOM NUMBEP OF CHECKS FOR KEY PPESS
120 TIMER=0 FOPN=1TORND(50)+50 A$=INKEY$
129 REM CONSEQUENCES OF KEY PPESS
130 IFA$=""THENNEXT IFC=2THEN SOUND15.10
D=D+RND(1) GOTO50 ELSESOUND150.5 GOTO50
140 IFC=1THEN SOUND1.10 D=D+RND(1) GOTO50
1000 PEM GPAPHICS SUBPOUTINE . SELECT GREEN OR
YELLOW CHAPACTEPS
1010 SOUND200.5 E=E+1 T=(T+TIMEP)/2:GOTO50
1020 IFC=2 THEN G=16 ELSE G=0
1030 PRINT@B,CHP$(129+G).CNP$(135+G).CHP$(131+G).
1040 PPINT@(B+32).CHP$(133+G).
1050 PPINT@(B+65).CHP$(142+G).CHP$(138+G)
1060 PPINT@(B+97) CNP$(136+G).CHP$(136+G). PETURN
2000 REM YOU LOST
2010 CLS4 PRINT@41."YOU JUST
LOST". PPINT@71."YOUP LAST COMRADE". SOUND1 10
2020 PRINT@228,"BUT YOU KILLED".E "ENEMY"
2030 PPINT@322 "YOUP AVEPAGE ACCUPATE
FIPING". PPINT@360 "TIME WAS". PRINT
USING"###.##".T. SOUND(INT(T)).10
2040 FORN=255TO1STEP-5 SOUNDN.1 NEXT RUN
3000 PEM YOU WON
3010 CLS2 FOPN=1TO255STEP5 SOUNDN I NEXT
3020 PPINT@25."CONGPATULATIONS". PPINT@97,"YOU
DESTROYED THE ENEMY FORCE";
3030 PRINT@226."YOU LOST".D "OF YOUP MEN".
SOUND1 D+1 PPINT@290 "YOUP AVEPAGE ACCUPATE
FIPING". PRINT@326."TIME WAS"; PRINT
USING"###.##".T; SOUNDINT(T).100 RUN
```

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WANTED FOR ZX SPECTRUM colour monitor price negotiable Also old magazines Tel Durham 43362 (any time)

BBC MODEL A or B wanted Offers Tel Ringwood (04254) 77192



GONE FISHING GONE AWAY

L H Thomas of Bridge Close Haxby York writes

Q I recently bought a game called the 'Teleng Home Entertainment Centre'. I have managed to buy about four games for it, but it now seems impossible to obtain any more. I did write to the manufacturers, but received my letter back marked 'gone away', so I presume that the company has folded. In *Popular Computing Weekly* I read that the Games Centre in Oxford Street sells all sorts of computer games. Do you know if they stock them for my computer game? If not, do you know anyone who does?

A I went in and spoke to someone at the Games Centre. Although they had heard of the Teleng, they knew nothing about it — it was only a name to them. They do not, and never have, stocked games for it. Perhaps one of our readers can help?

CONSULT THE ORICLE

Melvyn Quek of Manor Way, Mitcham Surrey, writes

Q I am 14 and at present am using a ZX81. I wish to progress to an Oric-1, as announced in your issue 26, but I am unclear on a few points.

a) Will Forth be available on just the 48K version?

b) How much Ram will be available to the user on the 16K machine?

c) How many user definable graphics will there be, and will the character set include lower-case characters?

d) What will the tape transfer rate be?

A Forth will only be available on the 48K version. The amount of user Ram depends on whether you are in high res or normal mode. If you are in normal mode then you will have to use the *Grab* command to access the balance of the screen space otherwise reserved for high-res. This is not as complicated as it sounds. In high res there should be about 9K available to the user.

The tape transfer rate will be either 2400 baud or 300 baud if you want to take extra care against corruption. The whole character set is re-definable on the Oric. For further details see our review of the Oric in *Popular Computing Weekly* January 13.

A LIGHTER SHADE OF PALE

Keith Watson of Yardhurst Gardens Margate Kent writes

Q Can you give me details of how a light pen works, specifically for the BBC machine? Are there several different kinds? How easy would it be to make a light pen, assuming that the analogue interface was already installed?

A Basically, a light pen uses a photo transistor to measure the changes of resistance caused by light between a collector and emitter. You will need to use a BBC B machine because the A does not have the necessary joystick port.

The pen will read whether a dot is colour or black and white. There is a special register in the 6845 chip to control it. This register is accessible from Basic.

You should have no problems in fitting a light pen if you already have an analogue to digital converter. If not, there is a circuit diagram and all the necessary instructions in Stephen Adam's book *20 Electronic Projects* available from Interface.

WHOSE FAULT IS IT ANYWAY?

Brendt Wohlbert of Plover Road, George 6530 South Africa writes

Q I have been considering buying a ZX Spectrum and would like to know about the faults in the Rom. Are there later Roms improved or will an updated Rom be brought out by Sinclair?

What advantages does the Atari 800 have over the 400? Can the 400 be updated to include the features found in the 800?

A The faults in the Spectrum Rom are not immediately noticeable to the average user. As long as the user stays in Basic there will be little interference. The only two faults are that Screen$ cannot be concatenated and that if you hold a key down on a keyword, the cursor will not change and the keyword will be repeated.

Most errors will only affect machine code programs. There is also a section of redundant ZX81 code in the Rom. The best place to look for details of these is in Ian Logan's book *Understanding Your Spectrum* published by Melbourne House.

The Atari 800 features a full keyboard unlike the membrane on the 400. It also has a composite video output to enable it to be used with either a colour or black and white monitor. The Atari 400 is strictly speaking limited to 16K. A 48K memory expansion is available from Maplin although this voids the Atari guarantee.

MACHINE CODE WANTED

Saleem Gupta of Hounslow Middlesex writes

Q I have a Vic20 and would like to know why no one seems to publish machine code programs for it, including you. Are they particularly difficult to write? Could you please publish one for the unexpanded Vic — you publish them for the Spectrum and the ZX81.

Also, I would like to know why the memory add-on for the Vic is so much more expensive than for the Spectrum. I have been told that both the Vic and the ZX81 use the same memory chips. Is that true?

A Machine code for the Vic is a subject that does come up from time to time. We can only publish what we are sent and no one seems to be writing machine code programs other than the commercial software houses. Perhaps this is partly due to the fact that the necessary information is not as readily available to Vic owners as it is to ZX owners — witness the number of books on machine code and disassembling the Spectrum Rom.

As for memory, a manufacturer will charge what he thinks he can get for the product. It is not that memory chips for the Vic are particularly expensive, it is just that the ZX market is so competitive that prices have been forced down.

The price of Ram has dropped considerably since the original memory expansions were brought out. Sinclair was forced to drop the price of its 16K Ram pack for the ZX81 because other manufacturers were producing the same memory for half the price. This has not happened with other computers.

The Vic uses 2114s — the same as the ZX81, only the access time is different. Those on the Vic are faster, under 200 nanoseconds, and can be bought for about £1 each from component suppliers.

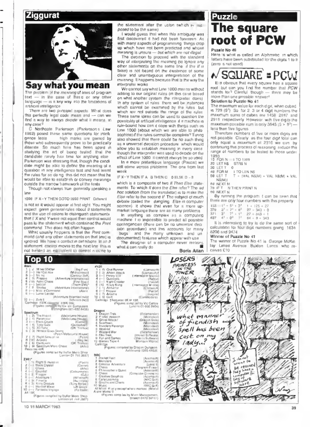
Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF.

Top 10

Books

1 (—) Enter the Dragon *Carter* (Melbourne House)
2 (1) Assembly Language Programming for the BBC Micro *Birnbaum* (Macmillan)
3 (2) The Working Dragon 32 *Lawrence* (Sunshine)
4 (3) Compute's First Book of Vic *various authors* (Compute)
5 (4) Spectrum Machine Language For the Absolute Beginner *Tang* (Melbourne House)
6 (—) Vic Programmer's Reference Guide *Finkel* (Commodore)
7 (7) Compute's Second Book of Atari *various authors* (Compute)
8 (5) Creative Graphics on the BBC Micro *Cownie* (Acornsoft)
9 (—) The Complete Forth *Winfield* (Sigma)
10 (8) Understanding Your Spectrum *Logan* (Melbourne House)

(Figures compiled by Watford Technical Books, Watford 0923 23384)
(Last week's position in brackets)



Ziggurat

Say what you mean

The problem of the *meaning* of lines of program text — in the case of Basic or any other language — is a key way into the limitations of artificial intelligence

There are two principal aspects: What does this perfectly legal code mean and — can we find a way to *always decide* what it means in any case?

C Northcote Parkinson (*Parkinson's Law* 1962) posed these same questions for intelligence tests — high marks are gained by those who subsequently prove to be practically illiterate. So much time has been spent in studying the art of being tested that the candidate rarely has time for anything else. Parkinson was stressing that, though the candidate might be able to define the meaning of a question in any intelligence test and had learnt the rules for so doing, this did not mean that he would be able to establish or convey meanings outside the narrow framework of the tests

Though not always true, generally speaking a line

1000 IF X=Y THEN GOTO 2000 PRINT "Different"

is not as it would appear at first sight. You might expect, given *general* rules about *If* statements and the use of colons to distinguish statements, that if *X* and *Y* were not equal then control would pass to the statement which contained the *Print* command. This does not often happen

What usually happens is that the *Print* command (and any other statements on that line) is ignored. We have a conflict in definitions. In an *If* statement, control moves to the next line. This is not treated as equivalent to control moving to the statement after the colon (which is supposed to be the same)

I would guess that when this ambiguity was first discovered it had not been foreseen. As with many aspects of programming, things crop up which have not been predicted and whose meaning is unsure — *but which are not illegal*

The decision to proceed with the standard way of interpreting the meaning (to ignore any other statements on the same line if the *If* is false) is not based on the existence of some clear and unambiguous interpretation of the meaning. It happens because that is the way the interpreter works

We cannot say what Line 1000 *means* without adding to our original rules (in this case based on what another system, the interpreter, does). In any system of rules there will be instances which cannot be examined by the rules but which are not outside the range of the rules. These same ideas can be used to question the possibility of artificial intelligence. If a machine is rule-bound, how can it cope with things such as Line 1000 (about which we are able to philosophise) if the rules cannot be complete? Turing also showed that there could be no such thing as a universal decision procedure which would allow you to establish meaning in every case. Though the interpreter was used to decide on the effect of Line 1000, it cannot always be so used

In a more pretentious language (Pascal) we still come across problems. The one from last week

IF X=Y THEN IF A=B THEN C=0 ELSE D=8

which is a composite of two *If Then Else* statements. To which *If* does the *Else* refer? The *ad hoc* solution (from the translator) is to make the *Else* refer to the second *If*. The subject of much debate (called the "dangling" *Else* in computer science), it shows that even for a more up-market language there are as many problems

In anything as complex as a computing machine it is impossible to predict all possible contingencies (there can be no universal decision procedure) and this accounts for many "bugs" and the many unknown and (undocumented) features which appear with use

The designer of a computer never realises what it can really do ■

Boris Allan

Puzzle

The square root of PCW

Puzzle No 46

Here is what is called an Alphmetic in which letters have been substituted for the digits 1 to 9 (zero is not used)

$$\sqrt{SQUARE} = PCW$$

It is obvious that every square has a square root, but can you find the number that *PCW* stands for? Careful though — there may be more than one possible answer!

Solution to Puzzle No 41

The maximum value for each digit, when cubed, is 729 (9^3). So for 2, 3 or 4 digit numbers the maximum sums of cubes are 1458, 2187 and 2916 respectively. However with five digits the maximum possible sum is only 3645 (5×9^3) — less than five figures

Therefore numbers of five or more digits are not possible. Clearly, as the four digit total can only equal a maximum of 2916 we can, by continuing this process of reasoning, reduce the range of numbers to be tested to those under 1999

```
10 FOR N = 1 TO 1999
20 LET N$ = STR$ N
30 LET T = 0
40 FOR M = 1 TO LEN N$
50 LET T = T + (VAL N$(M) * VAL N$(M) * VAL
   N$(M))
60 NEXT M
70 IF T = N THEN PRINT N
80 NEXT N
```

By running the program it can be seen that there are only four numbers with this property

153	$= 1^3 + 5^3 + 3^3$	$= 1 + 125 + 27$
370	$= 3^3 + 7^3 + 0^3$	$= 27 + 343 + 0$
371	$= 3^3 + 7^3 + 1^3$	$= 27 + 343 + 1$
407	$= 4^3 + 0^3 + 7^3$	$= 64 + 0 + 343$

It is interesting to try to do the same sort of calculation for four digit numbers giving 1634, 8208 and 9474

Winner of Puzzle No 41

The winner of Puzzle No 41 is George McKinlay, Limes Avenue, Buxton, Lancs, who receives £10

Top 10

Atari

1	(2)	Miner 2049er	(Big Five)
2	(—)	He I Can Ace	(Microprose)
3	(—)	Sn ng	(Centaur Soft)
4	(3)	Preppie	(Adventure International)
5	(18)	Astro Chase	(First Star)
6	(—)	Soccer	(Thorn EMI)*
7	(9)	Stratos	(Adventure International)
8	(—)	Missile Command	(Atari)
9	(—)	Lunar Lander	(Adventure International)
10	(—)	Zork II	(Infocom Inc)

Cartridge †32K cassette ‡48K disc

(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

Spectrum

1	(2)	The Hobbit	(Melbourne House)
2	(1)	Penetrator	(Melbourne House)
3	(—)	Black Crystal	(Carnell)
4	(4)	Time Gate	(Quicksilva)
5	(5)	3D Tanx	(DK Tronics)
6	(3)	Horace Goes Skiing	(Psion Melbourne House)
7	(7)	Flight Simulation	(Psion)
8	(10)	Arcadia	(Imagine)
9	(6)	Centipede	(DK Tronics)
10	(9)	Spectrum Micro Chess	(Artic)

Requires 48K

(Figures compiled by Buffer Micro Shop, London 01 769 2887)

ZX81*

1	(1)	Flight Simulation	(Psion)
2	(—)	Black Crystal	(Carnell)
3	(—)	Chess	(Artic)
4	(—)	Gauntlet	(Calcumma)
5	(2)	Frogger	(CDL)
6	(—)	Adventure 1	(Abersoft)
7	(9)	Firmaria	(Automata)
8	(3)	King Dracula	(Tony Barber)
9	(—)	Mankel Maze	(JK Greye)
10	(—)	Fantastic Voyage	(Fo lcade)

All 16K

(Figures compiled by Buffer Micro Shop, London 01 769 2887)

Vic20

1	(4)	Grid Runner	(Llamasoft)
2	(3)	Abductor Attack	(Llamasoft)†
3	(—)	Penny Slot	(Interceptor Micros)
4	(—)	Quackers	(Rabbit)
5	(—)	Night Crawler	(Rabbit)
6	(10)	Krazy Kong	(Interceptor Micros)
7	(1)	Abductor	(Llamasoft)
8	(—)	Hopper	(Rabbit)
9	(7)	Arcadia	(Imagine)
10	(5)	Gorf	(Commodore)

Cartridge †Requires 8K or 16K

(Figures compiled by Vic Centre, London 01-992 8904)

Dragon

1 Dragon Trek	(Salamander)
2 Planet Invasion	(Microdeal)
3 Ghost Attack	(Dragon Data)
4 Scarfman	(Microdeal)
5 Invaders Revenge	(Microdeal)
6 Alcatraz	(Microdeal)
7 Wizzard War	(Salamander)
8 Star Trek	(Impact Software)
9 Fun and Games	(Shards Software)
10 Games Tape 4	Morrison Micros)

Cartridge

(Figures compiled by Dragon Dungeon, Ashbourne 0335 44626)

BBC

1 Rocket Raid	(Acornsoft)
2 Monsters	(Acornsoft)
3 Colossus Adventure	(Level 9)
4 Chess	(Program Power)
5 Philosopher's Quest	(Acornsoft)
6 Chess	(Computer Concepts)
7 Creative Graphics	(Acornsoft)
8 Early Learning	(BBC Soft)
9 Graphs and Charts	(Acornsoft)
10 Music	(BBC Soft)

All Model B only except where marked A and Model B

(Figures compiled by Micro Management, Ipswich 0473 59181)


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